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VOL. I. JANUARY, 1901. No. 5.

THE COURSE OF STUDY

A PUBLICATION FOR TEACHERS AND PARENTS

ISSUED MONTHLY—TEN NUMBERS A YEAR.

Pedagogics of Nature Study

Wilbur S. Jackman

Imaging

When an object or a physical phenomenon is presented to one or more of the senses, an effect is produced that in no conceivable manner can be said to resemble the cause. The phenomenon of vibration derived from a blow by a hammer striking some object may be traced along purely material channels, and its rate of movement is but a problem in mathematical physics. At a given point, however, its physical identity is lost, and in its stead there flashes out a mental phenomenon which remains. Assuming the integrity of the senses, each normal individual must bear witness to the constant correspondence between the physical presentation and the psychic result which is called an image. It is not properly an image, though, if there is associated with this word its ordinary meaning. An image is a likeness or a counterpart. The mental image is not a *likeness*, but a result which is remarkable in its *unlikeness* to the cause. In the process of living, during the conscious hours there is a continual effort, first, to interpret these psychic results; that is, to refer them to the proper material source; and second, to organize them—that is, to discover by what relations they are associated. These operations are to the end that one may obtain his bearings and preserve his proper place in the scheme of creation. The process of education is the systematized attempt to economize this effort. It accomplishes its purpose only as it keeps unobstructed the pathway between the physical and the psychic phenomena, and so far as it discovers methods of interpretation and organization that can be applied under the proper motive in dealing with psychic results or images.

Mental images, although bearing no resemblance to each other, may be considered as related when they can be referred to the same external source. The sound of the hammer striking a nail, the appearance of its falling through the air, the sinking of the nail into the wood, all give rise to images that it is impossible to compare with each other. Yet they are related, since they are referred to a common cause. When the psychic results of the sight giving color, and of the sight giving the effect of the blow upon the nail, and of the sound giving the substance are interpreted as belonging to the same thing, the hammer, they become organized at once as the related parts of the image of the hammer, which has a certain form, weight, and substance. Psychic results may be produced from outside occurrences which follow in immediate sequence in time, or which may take place simultaneously, yet this time relationship, alone, will not admit of their being organized into an image in the educative sense. As

the hammer falls, a bird may fly across the field of vision; but the psychic result of the latter bears no educative relation to those derived from the hammer.

In nature study, the landscape, embodying the entire field of observation, presents itself to the beginner as a great composite of confused parts, and to most people, perhaps, it always remains so. It should be the aim of instruction to assist the pupil to refer the separate and more or less confused mental impressions to the appropriate source, and as this is done, to organize those referred to the same source into a clear and definite image. The landscape is revealed to the observer through its color, the initial interest being roused through the æsthetic sense. Everything, therefore, which involves color can be referred to a common external source, namely, light. All color impressions consequently become organized in the mind, since they are related to a common cause. Whether it is the foliage of a tree or the decorative colors of a room, the questions arising in both are solved by this relation to the one thing, light. Still further, in plants many of the myriad varieties in form are nothing but inextricable confusion until their relationship to light is recognized; then the seeming confusion of forms becomes an orderly array. Even two structures so extreme in their unlikeness to each other as a leaf and the human eye become related, from the fact that each represents a concession of the organism to the same controlling cause found in light. A large number of landscape phenomena, therefore, may be grouped together, from which there will be formed an image of related parts representing the effects of light. Another group of phenomena will be referred in the same way to heat, another to moisture, another to soil, and so on. The channeling of the grassblade and the bladdery vesicles on submerged plants as isolated facts are of little importance. But when the one is recognized as a dew-spout and the other as a swim-bladder, and that both are an attempt to make friends with water, they become the organized parts of an image that is fundamental in the study of botany. Imaging thus begun opens the way to endless study. Simple enough in the outset to be clear to the child, the last step in scientific research is but the latest attempt of the trained mind to define more clearly the same image. Nature study is not only the amassing of facts, it is also the organization of facts; science itself is nothing more. This kind of image growth is continuous. The demand for details for an ever incompleted image impels that research which always marks the true student of nature.

Function of Expression in Education

Francis W. Parker

Syllabus for Faculty Discussion

I. The best expression requires the best thought. The best thought causes the best growth of the nerve centers. Expression is controlled by motive; the higher the motive the greater the demand for expression and thought power.

1. The phrases, "the best expression," "the best thought," may seem vague and indeterminate, but certainly every teacher should demand of pupils and should direct all teaching skill to bring about nothing less than that. It is perfectly safe to say that all the movement in the development

of the child's mind should be in the best possible direction — that is, in the most economical direction.

a. The best expression is that which is clearest, most legible, and most intelligible to the minds of those addressed.

b. It comes the nearest to the realization of its end and aim.

c. The best, most complete action of body, mind, and soul is the most economical movement in realizing an ideal.

2. The best expression demands the clearest, most distinct, most concise thought.

a. Carelessness in expression is generally due to carelessness in thought.

b. The form of expression may have many imperfections, and still if it is commensurate with the ability of the child it may be called the best.

II. The highest exercise of the body, the development of the brain by self-activity, the growth of thought power, and the cultivation of motive depend upon expression in all its modes.

1. The proof of this fact, of such tremendous importance in education, is found in the law of "motor discharge" (Dewey); in "dynamo genesis" (Baldwin); in "man a reactive animal" (James).

a. Sensations are held in nerve centers *for growth* by automatic discharge.

b. Holding a sensation or group of sensations is accomplished by motor discharge.

c. When an image becomes strong enough for conscious discharge through the agents of expression (voice, hand, body), the will controls and directs the movements.

d. Holding an image causes that image to grow by expansion and concentration.

NOTE: Images form the essential mental basis of analysis, judgment, inference, reason, laws of causation, and abstraction.

There is an unconscious, or automatic, tendency of all thought to manifest itself. All sensations, under the law of motor discharge, react or move out through the efferent nerve tracts. The result of this partial motor discharge is an emotion which accompanies all study without realizing the thought in expression. When thought is expressed by any of the modes, self-criticism often becomes painful by the recognition of the fact that the expression is inadequate to the thought.

III. Attention is the holding of images for growth by the aid and stimulus of external objects. If held, images must grow. When they cease to grow it is impossible to hold them.

1. There are three modes of attention:

a. Observation—the direct action of an object upon consciousness for the purpose of acquiring an image corresponding to the object.

b. Hearing language—imaging under the stimulus of oral sentences, reinforced by emphasis, including harmony and gesture.

c. Reading (in all languages)—imaging under the stimulus of printed sentences.

To this list may be added reflection, which is imaging without the direct action or stimulus of external objects.

NOTE: Observation of pictures, maps, sculpture, may be counted as a mode of attention. The picture contains certain related attributes of the object represented.

IV. Modes of expression. Through the vocal organs—voice, speech, vocal music. Through the whole body—gesture. Through the hand—making, modeling, painting, drawing, and writing.

1. Attention demands expression:

a. For the steady holding of images.

b. For self-criticism in the realization of images. (In no other way can the need of clearness, distinctness, and relation be made apparent to the student.)

2. Memory demands expression. (Strong related images are the basis of recollection.)

V. Subjects for mind nutrition or growth.

Explanation: In the mere forms of attention and expression there is no substantial image growth. There is a vast difference between the means of growth and the growth itself.

1. Nutritious subjects are comprehended in Nature and Man. The study of Geography (or Physiography) is the imaging of the earth's surface. Geology is the history of the earth's surface. Mineralogy is the composition of the earth's crust. Meteorology is the study of heat, its source, cause, distribution; the study of air and its distribution by winds; the study of moisture and its distribution.

2. The function of moisture (water) and air in changing the earth's surface.

a. The function of moisture in relation to living organisms—plants, animals, man.

3. Plant life (Botany), its relations to Geography, Geology, Mineralogy, and Meteorology.

a. The function of plant life in relation to animals and man.

4. Zoölogy (animal life) and its relations to plant life, to its environments.

a. Its function in the support of man's life.

5. Man.

a. Environment: Geography, Geology, Mineralogy, Meteorology, Botany, and Zoölogy.

b. Anthropology: Anatomy, Physiology, Evolution, Psychology, Ethnology (sociology); influence of society upon man.

6. Archæology: the ancient work—arts and crafts of man—buildings, tools, implements, etc.

7. Philology.

a. The languages in relation to the thought and evolution of man.

b. Written history the record of man's life.

c. All changes in organic matter are under the laws of Physics and Chemistry. All study may be called study of change. There are the changes physical and chemical, and the changes in life under laws that have not been discovered. Thus there can be no understanding of organic or inorganic matter without the study of Physics and Chemistry.

NOTE.—It will be seen that all these subjects are really *one*. It is impossible to understand one subject without the other subjects. The growth of images corresponding to objects, subjects in Nature and Man, is fundamental and essential knowledge.

The strength of all images consists in their accurate correspondence and relations. Strong memory means strong related images.

Questions for Discussion

If the foregoing is reasonably true, then the following questions may be discussed:

1. Is expression absolutely essential to the growth of mind, body, and soul?

2. Has each mode of expression a definite, reactive, educative function for which no other mode or all the modes can be substituted?

3. In the use of all modes of expression is there a definite relation to the growth of the being?

4. What is the function of each mode of expression?

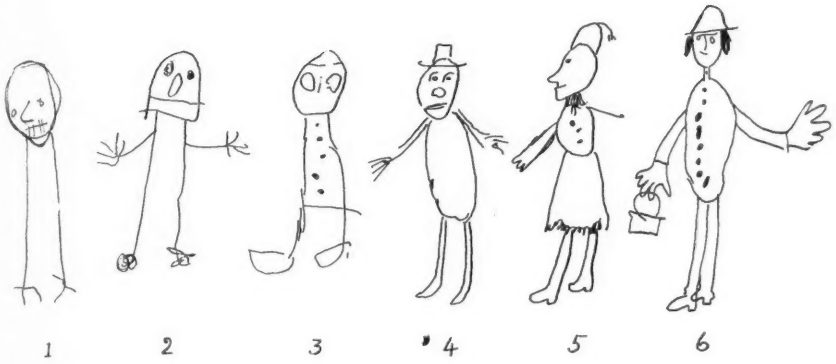
5. Should each mode and all the modes of expression be used continuously in teaching?

6. If one mode is omitted, will there be a lack of education?

7. How are teachers to determine the modes of expression to be used in given cases?

8. Is it true that all teaching should have for a purpose the growth of an image or apperceptive mass?

NOTE.—A common and fatal error in teaching is the fancy that students have certain images when they do not have them. Images in children, and indeed in most persons, are vague and anything but strong. The teachers fancy that children have the thoughts that they (the teachers) have, and therefore vainly strive to accomplish the impossible.



A Few Suggestions on the Teaching of Art

John Duncan

No error in the teaching of drawing has been so malign as the imposition upon the child of ideas and methods beyond his stage of culture.

Our systems of drawing have come to the common schools from the studios, and though they have a place and function there, they have proved worse than ineffective with the little ones. The method proper for the advanced student will not do for the beginner. There is in the art schools an immense insistence upon technique, but the children must have free swing. Even in the studios this has been carried too far; the art of our time is too much a thing of mere technical accomplishment. Is not the life more than meat, and the body than raiment? Instead of forcing our adult art and our ways of regarding things upon the children, we had better make a serious attempt to understand theirs, and to help them to realize themselves.

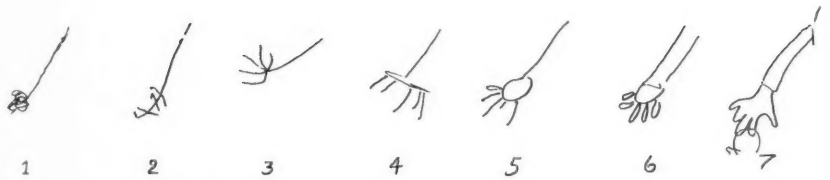
In looking over the drawings done in the schools, one is surprised to find how small a part the human figure plays, although man is surely the most interesting object to man.

In our theorizings we speak of man and nature, but in our practice things are reversed and nature takes the precedence. The art of our picture galleries is principally devoted to landscape, effects of light and air and perspective. It may be that human kind and animals would have a larger place in the art of the child if he had a freer choice in the matter.

This is practically recognized in the picture books that we give to children, and if they are compared with the class of work cultivated in school, the difference in vitality is apparent enough. The art of the picture book is vivid and spirited, it is crowded with interest and incident; school-room art is dull and lifeless. It is true picture books are not all that they should be. They are often frivolous, if not actually vicious. But the point is, they have life in them; and the school-room art, though morally irreproachable, is dead, like the horse that had every virtue and only that one fault.

The drawings that children make for their own delectation have always meaning and movement. "This little girl is crying because she is going to school without

ILLUSTRATION OF THOMAS THE RHYMER
Drawn by a child of twelve. See page 404



having learnt her lessons," said a wee lass to me, indicating her drawing.

I remember when I was a boy with what infinite delight I used to watch a fellow-pupil in our school in far-off Scotland draw on his slate unending conflicts between Highlanders and Sassenachs (Saxons; i.e., English). As the men were slain they were wiped off the slate, and redrawn stretched upon the ground. So we overleapt the bounds of pictorial art and invaded the dramatic.

This vital speaking art that the child brings with him when he comes to school is not appraised at its true worth by the teacher, who disdains its rudeness, and fails to read into it all that the child himself sees. The little chap whose imagination is seething with shapes of joy and terror is asked to focus his attention upon things that have for him no charm or significance.

The teacher is impatient with the crudity of his drawing, and cannot wait for the slow and orderly growth of his images of form and color; too often, indeed, she neither knows nor cares if there be any natural order of development; and in forcing him she blunts the freshness of his joy in expression, if she does not kill the art instinct in him altogether.

Let us look at a few drawings done spontaneously by children and see what we can make of them.

The drawings shown in the accompanying cuts (numbers 1 and 2) are the work of very little persons of kindergarten age, and must be regarded with some indulgence.

You will observe that the child states simply a few facts about the form. Beginning with an almost pure symbol, he adds fact after fact until something of the real appearance of the form begins to come out. There is of course no stereotyped order in the growth; one artist seizes upon one feature and gets to some clearness upon that, and another another. But an examination of these drawings would seem to offer some suggestions toward an ideal order—the mean between individual extremes.

The face is the most arresting and interesting part, and may develop earlier than the other parts. In Fig. 1 we see the head supported on two limbs—the main fact about a man stated viz., that he has a head and carries it around on something. The body is not so important as the arms and legs, which have a more obvious function. The nose is very successfully dealt with in Figs. 1 and 2, its projection in the first and its volume in the second.

Fig. 3 is rather anomalous, wanting arms altogether. He owes his position to his possession of a body, though that is got by a short cut, rather illegitimately, by merely drawing a line from leg to leg and by the addition of a row of buttons—a little technical trick.

The body is first clearly expressed in Fig. 4. The waist and neck and head are added in Fig. 5, which also exhibits very successfully the features as seen in profile. Fig. 6 has his hat well planted on his head, and hiding the top of it as it would in nature, instead of being added above the fully exposed head as in the other cases given. The hand is a triumph; one might

almost suspect that the little artist was somewhat vain of his skill in doing hands, they are brought out so prominently.

In another plate a few drawings of the hand are arranged in a series. In the first figure, the position alone of the hand is suggested. In the second, the fingers are added, simply by drawing three lines across the line representing the arm. In the third, the radiation of the fingers from the wrist is expressed. In the fourth, the student seems to feel dimly that something intervenes between fingers and wrist, and in Fig. 5 this something, the mass of the hand, the palm, is drawn with an appreciation of its shape. In the sixth, the fingers are represented, not by mere lines, but by contour of their mass—a very important step; and in the seventh the fingers are apprehended as continuations of the mass of the hand instead of appendages tacked on to it.

This process may be continued till the thumb is differentiated from the other fingers and the fingers from each other, by an ever subtler appreciation of their varying shapes, proportions, and movements.

On pages 402 and 404 we give two pictures by older children, of eight and twelve years, respectively. One represents two mediæval knights tilting at each other. The artist's interest in knights and armor was awakened in the Paris Exposition by a statue of St. George and the Dragon by Fremiet. He tried to draw it from memory, but found that his ideas were a little vague, and went back and back to the statue, looking at it from every point of view. From this he launched out into original composition, and in the Musée Cluny and the Petit Palais he worked up the details of the armor. In the street he observed the horses carefully, looking for the typical war-horse at every cab-stand.

The other picture illustrates the ballad of *Thomas the Rhymer*. The tale is a Scottish version of the Tannhäuser story. True Thomas, a court poet, is beguiled by the Queen of Faery and carried off to her palace, returning only after the lapse of many long years, when his hair has turned gray and all his friends have given him up for dead.

The road is seen winding away into the distance. The steep and narrow way to heaven is shown, and the broad and easy path that leadeth to destruction. The fiend

waits for his prey at the mouth of the pit. Between the citadel of heaven and the cave of darkness lies the happy valley of Faeryland, with its flowery woods and its fantastic castle. The picture represents the first meeting of the minstrel and the queen.

Textiles

Clara Isabel Mitchell

Weaving: Apparatus for teaching the beginning of weaving and foundation weaves may be so simple in construction that it can be made by children six and seven years old. Mats and holders have been woven by children of the First Grade on blocks of ½-inch pine wood 6x12 inches, with a row of small nails driven at intervals of a quarter-inch entirely around the face of the board, a quarter-inch from the edge. This size was chosen as a convenient one for making the articles needed, but boards of other dimensions might be more practical for other purposes. The weaving on such an apparatus is really darning, and is done with a darning or packing needle. The material used is a heavy carpet yarn or cotton roving, chosen for its coarseness, because results are better with the coarse material, also because it is not so taxing to the child. The warp threads may be of one color and the filling of another; or the warp may be striped and the filling put in correspondingly to form checks. The warp—one continuous thread—is stretched up and down the length of the board around each of the nails at the ends. The filling may be put in as in darning, over one warp thread and under the next, alternately, making what is known as the plain weave. If this is varied by drawing one filling thread under two or more warp threads and breaking the order of the plain weave, we can teach twill, satin, and basket weaves. When the strip 6 x 12 inches is finished, it can be slipped off the loom, doubled, sewed or laced together, and will be useful as a holder for the poker, tongs, or tea-kettle.

A little loom which has been found useful, and which illustrates the principles of weaving, is made in the form of a rectangular frame, with an upright fastened in each corner, and poles or little beams extending across the ends of the loom between each pair of uprights, which have been bored through with holes large enough for holding the poles. Warp threads are tied to the poles and stretched tightly by rolling the poles. After tying an end to one of the poles or rollers, the thread should be drawn through a heddle before tying to the other roller. The heddle or harness may be made in various ways. It may be of cardboard cut with slits alternating with holes so arranged as to hold one set of warp threads, while another set is lowered or raised. A different harness may be made by a system of threads tied to a heddle frame, loops so alternating with free spaces that the warp threads are held as in the harness just described. The most primitive harness is illustrated in pictures of the Indian, Mexican, and oriental looms, simple in construction but slow in operation. Shuttles or bobbins may be made of pasteboard or of wood, and should be as long as can be conveniently held, and used in the selected warp. Packing needles may be substituted when the shuttles seem cumbersome and awkward, and often the weaving is best done with the fingers alone.

The looms and harness last described may be made any size desired, practical

experience having proved the usefulness of several sizes, varying from 12 x 6 inches to 24 x 36 inches. On these have been made small rugs, mats, strips for ornamenting curtains, and bags. Larger rugs or curtains can be made by sewing or lacing together strips or blocks woven on these small looms.

With even the youngest children, and in the beginning of weaving, it seems wise to attempt something of design, not only for the educational value of pattern-making, but also because of the interest added to the work. Patterns based on the square and triangle are the only ones which can be successfully carried out under the limitations of material and process, and these grow into fineness and complexity with close arrangement of warp threads; warp threads placed closely together, giving greater opportunity for fine variation of forms in the pattern. The detail of oriental geometric designs may be taken as suggestive; the patterns made by the North American Indians, especially those in the Navajo blankets, are best of all.

Of the different ways of weaving in patterns, perhaps the safest to recommend is that of weaving straight across the warp in whatever colors are indicated by the pattern which is being followed, using a different needle or shuttle for each separate patch of color. Another way is to weave in the special figures separately and leave them unconnected at the sides, as in the kelim weaves. Great care will be necessary to keep a piece of work straight, with edges even and parallel. A help to this is the habit of keeping the filling thread loose; another, a thick cord at either edge of the warp to act as listing. A final recommendation in this work is that all weaving be of articles for which there is a use—one recognized by the children and felt by them to be genuine.

NOTE: The carpet yarns having proved to be the most satisfactory material used in children's weaving, the Institute has been able to secure some from the factories. As manufacturers will not sell small quantities, the Institute has on sale in the Book Room a limited quantity of the yarns which can be bought by teachers who wish to buy in small lots. It should be ordered by sample, at 50 cents per pound.

Constructive Work in History

Emily J. Rice

In selecting the material for work in history, we must consider certain prominent interests at the different periods of growth which need their own expression in action. The phases of the past which show these interests expressed most simply and completely are best adapted for study. For instance, the dawning interest in citizenship in the higher grades may be expressed in the attempt to regulate the affairs of the school-room in accordance with the types of government seen at work in political life. The difficulties experienced by the children in attempts at self-government may be then shown, as those met by people of the past and overcome in various ways with various results. These difficulties thus appear as problems, and the child's own powers are at work in their solution.

This is a type of the work that is valuable in history. The end in view is the realization of the present through a knowledge of the past. Here the constructive work is the dramatic expression of the forms of government worked out by the

children and any mechanical work or art which helps to give vivid images of the period studied. The historic time to select for the illustration is generally the one in which an institution arose, for, in the necessity for the institution, the problem shows to the best advantage. The children who study carefully the critical period of our history, with its evident tendencies toward anarchy unless a balance were found in some centralizing force, ought to carry away from the study an understanding of the necessity for yielding individual preferences to the general good and a new respect for the rights of others. At least we may hope to do more by presenting the problem in this indirect way than we could by discussion of the relation between a central authority and individuals as an abstract thing.

Mere intellectual appreciation is not enough. The results of this appreciation must be carried into action by the children themselves in order to develop character. The test of the work is the insight the children show into the value of the laws of the school-room and those of the governments they see around them in the city and country, and their more harmonious adjustment to these laws.

The same principle of selection should cause much of the work in the lower grades to be along industrial lines. As the little children are especially interested in the activities of the home and neighborhood, the work in history should extend these activities and illustrate them by the methods and inventions of the race in the same directions. The people to study here are the ones who made the particular inventions in which the children are interested. The constructive work is the putting into form, by handicraft, of the ideas developed in solving problems suggested for present needs or for the needs of the past.

In selecting for the younger children people to study whose inventions were in a crude state, whose work was done in primitive ways, whose social life was simple, whose art expressed love of brilliant color, whose literature set forth a few foundation principles of ethics, we may give a contrast with their own lives that will show the progress of the race and have material for handwork, which will be the result of the child's own invention. The questions presented should be those of the simple industrial arts—how people have gained their food and clothing, how they have provided themselves with houses, tools, and implements, and how they have gradually improved these things, through the pressure of necessity and changes of environment. These questions the children should answer for themselves, and what they make as handwork should be giving form to their own inventions. This handwork will, at first, be very crude, but as higher types of historic life are presented, we may expect a gradual gain both in the skill of the children and in their appreciation of their inheritance from the the past. In our methods of work there must be constant comparisons between present conditions of the industrial arts and those of the past.

SUBJECTS SUGGESTED: 1. Modes of getting food: Production; transportation; distribution; cooking; utensils; pottery.

2. Architecture: Materials; construction; lighting; heating; tools; decoration.

3. Clothing: Sources; manufacture.

4. Modes of travel.

EXAMPLE: STUDY OF CLOTHING (Second Grade): Examination of the warmth of fabrics used for wearing apparel will cause inquiry into the sources of these materials and an interest in the problem of manufacture. A visit to a cotton or woolen factory would be a good introduction. If this is not practicable, pictures of pres-

ent methods of manufacture may be shown to the children. Trace the history of a piece of cloth from its source to its use in clothing.

SOURCES — Wool: Take an excursion to see sheep, if possible. Show pictures of sheep on the farms, and of the washing and shearing of the sheep. Show wool, washed and unwashed.

Cotton and flax: Show pictures of flax growing and of cotton plantations, and of laborers at work on the plantations. Show the raw cotton and flax.

Silk: Use specimens or pictures of silkworms, pictures of mulberry trees, and of the methods of cultivation of the silkworm. Tell the story of the missionaries who brought the silkworm from China to the West.

Represent in miniature form on sand tables: A farm where sheep are raised, a cotton plantation, a field of flax, a place where silkworms are cultivated. Sand, cardboard, wood, and twigs may be used. Let the children write stories about these scenes.

MANUFACTURE—Spinning: Give the children raw wool or cotton, and let them experiment to see how threads are made from it. They will spin with their fingers and discover how awkward it is to hold the material. This will lead to the invention of the distaff, at first a twig. Let them make a smooth stick to use. Next, they will discover that they need something on which to wind the yarn spun, and will invent a spindle, at first another stick. By practice they may improve this until it is a smooth stick with a notch and a wheel. The wheel may be placed so that the spindle will spin like a top.

History of spinning: Tell stories of people who dressed in skins, and of the way in which these people got their food. Tell stories of shepherd life, and adapt the story of the shepherd boy who learned to spin from Ramsden's *Cotton Spinning*. Show pictures of people spinning with spindle and distaff; for instance, the Greeks.

Now let the children consider the difficulties of spinning in this way, and show them spinning-wheels, both wool and flax. They may make parts of toy wheels. Tell them stories of colonial times, and of our grandmothers and their work. Show them the process of carding, and teach them to use the cards. They may next dye some of the yarn with vegetable dyes, and select colors for use in weaving.

Weaving: Let the children suggest methods of weaving, and the possible ways in which weaving was invented. Adapt the story of the invention told in Ramsden's *Cotton Weaving* and tell it to them. Show specimens of weaving with vegetable fiber; for instance, Indian and Hawaiian. Let them also invent looms. They should make looms about a foot long, with end pieces that roll and a cardboard heddle. They may weave strips for some useful purpose.

The Fifth Grade children might make a colonial wheel and colonial loom, and do some work on them, to aid the Second Grade.

Finally, there should be a comparison of the children's work with what can be done by modern methods. Let them examine fabrics, and note beauty of texture and design.

Excursions to the Field Museum to see wheels and looms; to the Art Institute to see tapestries.

References: Richard Marsden, *Cotton Spinning, Cotton Weaving*, p. 9–55; *Indian Tribes of the United States*, v. I, p. 76; Government Report, Eleventh Census, 1890; Report of Bureau of Ethnology, 1884–85; Murdoch, Point Barrow Expedition (1887–88); Ratzel's *History of Mankind;* Nadillac, *Stories of Industry;* Yeats, *Commerce and Industries;* Johnson's Encyclopedia (wool); Murché, Science Reader; Mason, *The Origins of Invention.*

Pedagogic School: During the past quarter the students have been studying the

origin and history of the industrial arts. They have dwelt especially upon primitive conditions with a view to the use of these arts in the teaching of history in the primary grades. This month we shall picture the industrial conditions of primitive people and work out plans for teaching.

In tracing the progress of early man toward civilization, we shall need to make a close study of geographical environment. The students will consider the adaptation of the continent of North America to people in the hunter and agricultural stages of life, and trace effects of different regions upon the aborigines.

References: Payne, *History of America*, vol. 1; Fiske, *Discovery of America*, vol. 1; Winsor, *Narrative and Critical History;* Shaler, *Story of Our Continent;* Shaler, *Nature and Man in America;* Shaler, *United States.*

Art in Connection with History: (JOHN DUNCAN.) The students will make drawings in colored chalk upon large sheets of gray paper to illustrate the lessons which they will by and by give to the children. These drawings will represent weapons and tools, and scenes from primitive life showing the manners, occupations, and fortunes of the hunter, shepherd and farmer. The training class will also mold the simplest forms of pottery and decorate them with raised and with incised designs.

For work in textiles see Miss Mitchell's outline. An outline for the study of pottery in connection with history will appear in February.

Geography

Zonia Baber

Action rather than reflection characterizes children; hence the desire to create should be given scope for its normal realization.

That expression is a potent factor in education is recognized by all thinking teachers; but the value of the various forms of expression, making, modeling, painting, drawing, dramatic action, in their reaction on thought has not been generally appreciated. Language, oral and written, has been almost the only means employed in the expression of the subjects studied in the schools to within recent times. The other modes of expression were either not taught at all or were divorced from the thought content of the subjects of study. In the study of geography, the necessity of making, modeling, drawing, painting, and dramatic action, as well as speech and written language, cannot be ignored. It is in the making of rivers, valleys, sea-cliffs, sand-bars, beaches, sand dunes, etc., in the laboratory that the fullest appreciation of the work of running water, waves, and wind is found.

The making of characteristic costumes and dramatic representation of customs and industries lead to a better understanding of the people of the various countries. The relief of landscape is most easily and accurately represented by modeling, hence this mode of expression should precede the others in the study of the form of a country. Drawing, though more difficult than modeling, is necessary as a graphic representation of form; while color, which is most important in imaging a landscape, demands the use of paints. When the black of the blackboard has been relegated to the limbo of the past, and certain colored boards on which colored crayons may be used with pleasing effects surround the school-room, the accuracy of the

CHALK MODELING

pupil's images of landscapes will be greatly enhanced. Making, modeling, painting, drawing, oral and written expression are used throughout all the grades of the Chicago Institute in teaching geography. (See page 410.)

In the elementary grades, whatever aspect seems most characteristic of the people studied will be dramatized. For instance, the Fourth Grade, in the study of Lake Michigan and sea life, will represent certain aspects of a life-saving station.

The Sixth will represent in costume a street scene in southern India—a school sitting on the ground in the shade of a building, natives weaving at the side of the street, pounding brass, grinding corn, and selling small wares.

The ability of the teacher to draw, paint, and model will enhance immeasurably her power in teaching geography. For this reason, as well as for the closer observation and study which results from the demand for expression, the pedagogic class will be required to express themselves continually in these different modes in order that clearer images and greater skill in expression may be acquired.

Pedagogic Class: During the autumn quarter the pedagogic class have tried to interpret some of the physiographic aspects and human activities of the Chicago region. They visited the places where the best examples of certain earth-shaping processes obtain, as along the north shore for stream and wave work; to Dune Park for wind action; to Stony Island and North Shore for glacier work.

A special visit to a farm, together with the human interests exhibited in all the region, formed a basis for the consideration of man's adaptation to his geographical and social environment.

Besides the blackboard drawings necessitated in the class discussion, the students were requested to illustrate their papers describing the field trips.

The work for the quarter was summed up by lectures given by the students selected by the members of the committees into which the class is divided. The talks were illustrated by drawings, maps, charts, photographs, and by projected pictures. Model lessons were given by Mrs. Atwood to the First Grade and by Miss Van Hoesen to the Fourth Grade, and discussed by the pedagogic class.

The work for the pedagogic class for January will be a study of North America, its topography, climate, geological formation, and its influence on life and the world's civilization.

I. Consideration of North America as a great land mass in form, shape, size, drainage, and relation to the other continents of the globe.

1. Climate: Prevailing winds. Movement of storms in the United States. Distribution of heat. Southern limit of the winter isotherm of 32°. Distribution of rainfall; snowfall. What would be the effect on the climate of North America if the eastern and western highlands had been reversed in position? What would be the effect on the climate of the plain if a high range of mountains crossed the northern country from east to west?

What would be the effect upon this region if the Gulf of Mexico and the Caribbean Sea were land?

2. Western Highlands: Extent, altitude, appearance, and formation of Rocky Mountains, Sierra Madre Mountains, Sierra Nevada Mountains, Coast Range, Mexican Plateau, and Great Basin.

(a) Characteristics of river basin found in the western slope of the great highland mass, Colorado, Sacramento, San Joaquin, Columbia, Fraser, Yukon. What attractions for man does this western highland mass possess? What are the influences, both evil and good, of a desert or semi-desert region on the rest of the continent? For agricultural purposes which is to be preferred, an irrigated region or a region of constant rainfall?

3. Great Central Plain: Extent; elevation; winter and summer appearance; glaciated area; account for lakes; non-glaciated region.

Characteristics of the river basins: Mississippi, Mackenzie, Hudson Bay System.

Value of the great plain in the development of the continent.

Would a different arrangement of lowlands and highlands improve the continent as a home for man?

4. Eastern Highlands: Extent, appearance, geologic formation of (a) Canadian Highlands, (b) Appalachian System: New England Mountains; Blue Ridge; Appalachian Valley; Alleghany Forest; Alleghany Plateau; Piedmont.

Account for the position of Delaware, Susquehanna, Potomac, New, and Tennessee rivers. What is the effect of the Piedmont region on the rivers which cross it?

What is the value of the Appalachian Highlands to the present inhabitants of the United States?

In what way did they aid the colonists? What disadvantage were they to the colonists? What influence did they exert on the Civil War?

(c) Characteristics of St. Lawrence River basin?

5. Coastal Plain: Extent; appearance; formation; agricultural value. What influence did the coastal plain exert on early settlement? On the Civil War?

Materials which will be used in the development of the subject: Relief, physical, contour, geologic maps of North America and United States; geological portfolios; U. S. weather maps; crop bulletins; photographs; projected pictures; charts; diagrams.

References: Mill, *International Geography*, pp. 660-700; *Compendium of North America;* Reclus, *Earth and its Inhabitants;* Shaler, *The United States of America;* Davis, *Physical Geography; National Geographic Monograph;* Willis, *The Northern Appalachians;* Hayes, *The Southern Appalachians;* Davis, *Physical Geography of Southern New England;* Russell, *Rivers of North America;* Russell, *Lakes of North America;* Russell, *Volcanoes of North America.* See library reading list on North America.

Expression: The students will be required to model in sand the relief of the continent of North America and the different sections studied; to draw the same in relief on the blackboard and on paper; to make paintings and blackboard drawings of certain typical regions, as of the tropic plains, tropic mountain regions, and regions of Western United States and Mexico, Alaskan fjords and glaciers, northern and central plain, Appalachian region.

Besides discussions in class, the different committees will give illustrated talks on different parts of the country assigned for special study.

In what grade should continental study be introduced?

What kind of maps should be used at the beginning of geographic study?

How can a map be used to perform its function as a symbol?

Why do maps stand in the way of imaging the landscapes which they represent?

What laboratory experiments would aid in imaging North America?

What aspect of the country appeals most to younger pupils?

When should the physical geography of the continent be taught?

Correlation of German

Dr. Siegfried Benignus

It is generally acknowledged that the ideal method of studying German is to go to Germany, study under an experienced teacher, mingle with the educated part of the people, read newspapers, go frequently to the theatre, and attend public meetings and lectures. Since it is possible for only a few to use this best method, we must devise the means in our own environment to realize the most favorable conditions.

Many of the grammars used in school and private instruction are very faulty

in giving the student disconnected and meaningless sentences to work upon. The instruction resulting makes the living language an instrument that is useless in most of the affairs of practical life; and the victim of such instruction, when he comes in contact with the genuine language, execrates grammar and teacher. Nothing that is not at least good, every-day German should be taught. The student should occupy his mind and store his memory with nothing but forms such as Germans use. He must never think that he can speak or write German by patching together words with the help of his grammar and dictionary, for the natural sentence, not the word, is the unit of language. Whatever may be the pupil's object in view—speaking, writing, reading, or scholarship—from the very beginning he must be sensitive to the best German. He must think in German, dream in it, joke in it, live in it, as he does in his own tongue. That is to say, he must learn German in the same way and with the same means as he learns English. To attain this end, there is no better help than correlation with the other branches of study.

A good means of acquiring a working knowledge of German idioms is by the use of the language in mathematical work, both pure and applied. With this in view, suitable exercises will be carried through all classes and grades from the time the language is first taken up. For the first year (age 10) the following and similar exercises:

I. Absolute numeral problems:

(1) $42 + 35 = ?$
(2) $63 - 18 = ?$
(3) $12 \times 8 = ?$
(4) $84 \div$ by $12 = ?$

If the pupils are found able to handle fractions properly, graded exercises in multiplication and division of fractions will be given.

II. Concrete numeral problems:

(1) Mary lives in Frankfort on the Oder, 80 kilometers west of Berlin; her cousin Fred lives in Brandenburg, 60 kilometers east of Berlin. How many miles is it from Mary's home to Fred's?

(2) William bought a knife; the price was a quarter of a dollar. He gave the salesman a dollar. What change should William receive?

(3) The side of a square is 9 meters long. How far is it around the square? What is its area?

(4) James bought apples at the rate of 3 Pfennige for 5 apples, and sold them at the rate of 5 Pfennige for 3 apples. If he bought and sold 30 apples, did he gain or lose money, and how much?

This work will be extended to fractional problems, if pupils are found capable of profiting by them.

The work for the Sixth, Seventh, and Eighth Grades (forming one class) will be such as the following:

I. Oral arithmetic:

(1) Helen paid ¾ Mark for coffee and ⅛ Mark for tea. How much did she pay for both?

(2) In an orchard 25% of the trees bear cherries. What per cent of the trees bear other fruits?

II. Mental arithmetic:

(1) Henry traveled 200 miles in three days, 25% of which he traveled the first day and 45% the second day. How far did he travel the third day?

(2) What is the amount of 200 Marks for 1 year and 8 months at 6%?

The mathematical work for the High School until July may be judged from these topics:

History of mathematics:

Read up in Cantor's *Vorlesungen über die Geschichte der Mathematik*, Vol. I; and Ball's *History of Mathematics*, in the library, and report in writing on the following topics: Egyptian and Phœnician mathematics. Did the Greeks learn their mathematics from the Egyptians? Greek schools of mathematics. When and by whom founded? What did they teach? How long did they flourish?

(1) The Ionian School, (2) the Pythagorean School, (3) other schools. Schools at Athens and Czycus. Chinese mathematics and mathematicians. Hindu mathematics and mathematicians. Did mathematics originally start from experimental data?

Algebra:

What can you find about the beginning of algebra? With what nation did it begin? To what particular branch of mathematics did the

Arabs give most attention? Whence do we derive the arithmetical numerals 1, 2, 3, etc.? When did Diophantus live and teach? What particular things do we derive from him? When were Arabian mathematical works introduced in Europe? Explain how to multiply $a^2+b^n-c^5$ by $x^{\frac{1}{2}}-y^{\frac{1}{2}}+z^6$, and read the following expressions in German: $a\times x\times\sqrt{z}$; $\frac{x}{y}$; $z^{\frac{3}{5}}$; x^n; $\sqrt{\frac{x+y}{a+b}}$; $(a+b)(c-d)$; $a^2-b^2=(a+b)(a-b)$.

Let each member of the class present one or more essays on an eminent algebraist.

As observational work in astronomy can best be done during May, this important mathematical subject will be given exclusive attention during that month. Special attention will be given to the German of such subjects as these: Where and when do the sun, moon, planets, and certain bright stars rise, culminate, and set? How long is the sun above the horizon on any given day? How long below? Answer same questions regarding moon and planets. What planets are evening stars during May? What planets morning stars? What phases does the moon exhibit on the successive days of May? New moon, first quarter, full moon, and last quarter. Magnitudes of the brightest stars of the Great Bear, and other constellations. Names of the brightest stars visible during May. German myths relating to the constellations. Give a full description of an evening's study of the stars in the astronomy class. Write an essay on the colors of the stars. Tell all you know about variable stars, double stars. Describe a telescope. Write an essay proving from your own observations that the moon always turns the same face to the earth. Write an essay on the subject of the sun. Why does the sun never show phases? Look up in *Popular Astronomy*, in the library, the aspects of the planets for May, and locate on the sky where they all are. Make a report in German of the substance of any article in which you are interested.

References in Popular Astronomy: Diesterweg, *Populäre Himmelskunde*, 17th edition, 1892; Mädler, *Der Wunderbau des Weltalls*, 8th edition, 1887; I. I. von Littrow, *Die Wunder des Himmels*, 7th edition, 1885; Gretschel, *Lexikon der Astronomie*, 1882; Garret P. Serviss, *Astronomy with an Opera-glass*, 1899; J. Herschel, *Outlines of Astronomy*, 11th edition, 1871; Newcomb, *Popular Astronomy*.

The other branches of study may likewise be correlated. Accordingly the composition work for January will be a selection of general interest in zoology adapted to the capacities of the different classes, as was done in December with the subject of the Rhine.

Animal protections:

(1) shields, e.g. armadillo, turtles, beetles, mollusks.

(2) scales, e.g. fish, reptiles.

(3) quills, e.g. hedgehog, porcupine, sea-cucumber.

(4) stings, e.g. insects, stingray.

(5) nettle-organs, e.g. jelly-fish; burning hairs, e.g. caterpillars.

(6) feigning death, e.g. insects, opossum.

(7) secretions, nauseous, e.g. skunk, mink; colored, e.g. bombardier-beetle, seacat, cuttle-fish; slimy, e.g. eel.

(8) nests, e.g. birds.

(9) cocoons, e.g. insects.

(10) protective colorations, generally resembling surroundings; polar animals, mostly white; desert animals, yellow as sand; leaf animals, green or gray; water animals, transparent or slightly tinged with blue; land animals, color of ground.

(11) Rapid change of color, e.g. chamæleons, other lizards.

(12) masking, e.g. crabs, sea-urchin.

(13) mimicry, e.g. insects, birds.

(14) terrifying attitude, e.g. caterpillars, harmless reptiles.

(15) horns, teeth, claws, hoofs, as organs of defense and offense.

(16) defensive and offensive alliances, e.g. bisons, wild horses, wolves, monkeys, birds.

(17) insulation, e.g. marsupials in the Australian region, lemurs in Madagascar.

(18) parasitism, e.g. fluke, tape-worm, crustacea, insects.

References: Alfred Edm. Brehm, *Illustriertes Tierleben*, 10 vol., especially 3d edition 1892-93; Fritz Müller, *Für Darwin*, 1864; Beddard, *Animal Coloration;* Poulton, *Colours of Animals;* Gordon, *Animal Life;* Thomson, *The Study of Animal Life;* Wallace, *Natural Selection;* Carus Sterne, *Werden und Vergehen*, 3d ed. 1886; O. Hertwig, *Die Symbiose.*

Other appropriate topics in zoology are as follows: Animal homes, such as birds' nests, dens, holes, holes in earth, holes in trees, insect homes

as cocoons, nests, hives. Prehension of food, that is, methods by which animals receive food.

Topics of general interest in plant life: Food plants of the old and the new world. Protections against the attacks of animals (spines, thorns, prickles, nettles, nauseous secretions), and adaptation to atmospheric influence. Distribution of plants, (1) distribution of seeds, (2) adaptation as determined by climatic conditions.

The fine zoological and botanical specimens in the Museum of the Chicago Institute, which are most skillfully selected and arranged, will be an excellent aid in bringing the pupil directly in contact with nature. Excursions to the parks of Chicago and the environments of the city, and visits to the Field Columbian Museum and the Academy of Sciences, will reinforce and expand the acquired knowledge. As to the field trips of the whole school, they can be made more profitable than they hitherto have been, so far as German is concerned. Upon arrangement with the other instructors, the teacher of German might take charge of a section of the pupils for an hour or so, or, at a proper time, he might give a lecture to all the German pupils.

Geography also offers a vast field for correlation. Out of the following general topics, a great variety of appropriate subjects may be chosen, according to the necessities of the time being.

I. General Geography:

1. The earth as a celestial body.

2. The earth as a physical body; (a) interrelations of land and sea, (b) the sea, (c) the land, (d) the atmosphere.

3. Life on the earth; (a) the earth as a dwelling place for man, (b) the five continents.

II. Commercial Geography:

Plants, animals, minerals, international commerce, transportation.

III. Astronomical Geography:

(a) apparent movements of the stars, (b) the earth and the real movements of the stars, (c) determining of locations.

IV. History of Geography.

V. Political Geography.

The composition work for the month of December is the subject of the Rhine, for all classes. All the special grammar and orthography for each class is included in this month's work. The pupils have a keen interest in this, one of the most interesting rivers, to see which a great number of tourists come from all parts of the world, and the beautiful scenery of which is glowingly described in English literature (e.g. Byron: *Childe Harold*, Canto III; Longfellow: *The Golden Legend*, *The Castle of Vautsburg on the Rhine*).

A field for correlation quite as extensive, if not more extensive than that of Geography, is offered by History. As a beginning, it is intended to devote February to a study of the American War of Independence.

There is no doubt that the other subjects of study, including even Gymnastics, may be profitably correlated. The general plan is not yet formulated.

Should there be a demand for instruction in the Pedagogic School, appropriate selections in psychology, pedagogics, and history of education may be made.

The German songs that have been taught by Miss Goodrich have proved an effective means of correlation. Art also promises well in this respect.

On holidays and at other fitting times, performances, either composed for the occasion or taken from some good author, may be given. Frequenting the Chicago German theatre is also desirable. The teachers of the different subjects might give their pupils references to German text books, cyclopedias, and general literature. That other languages reinforce the instruction in German, particularly in the case of advanced pupils, is a matter of course. To make this reinforcement possible, it is absolutely necessary that the teacher of German should be conversant with the

classical languages, Latin and Greek, and, if may be, with French.

In all correlation, one great principle must guide the teacher; that is, to go from the easy to the difficult without leaving gaps, and to include in the instruction the difficult parts of grammar, adapted to the comprehension of the pupil.

These statements lead to the inference that the teacher of German should have broad culture and high capacity; otherwise correlation, instead of being a potent factor in education, becomes a shallow and unmeaning thing, which is likely to do more harm than any of the old methods.

For January the topics in grammar, orthography, and writing, as given in December, will be continued in all classes. In the fifth grade will be added: (a) place of objects in the schoolroom; (b) grammar: sentences involving the imperfect of "sein" and the present tense of "haben;" (c) simple expressions as: Wiegehtes Dir (Yhnen)? and the answers.

The reading exercises for the beginners is contained in Ahn's *First German Book;* 6th and 8th grades in Ahn's *Second Course;* High school, 1st and 4th year, continuation of *Bilder buch ohne Bilder;* 2d year, completion of *Der Neffe als Onkel,* and extracts from *Die Jungfrau von Orleans,* and from *Maria Stuart* for January. The memorizing work, the importance of which was referred to in December, is given in the grade outlines.

French

Lorley Ada Ashléman

The work for January will center about the preparation for February, the carnival month. It is proposed to have the school represent a world carnival, in which a procession of the nations will be joined to the French festival outlined below. All nations have their fêtes, their carnivals. Egypt celebrated the festive days of the Bull Apis; the Jews, the festival of Purim to commemorate their deliverance from the massacre planned by Haman; the Greeks, their feasts of Bacchus, and the Romans the Saturnalia.

In Persia and Babylonia at the beginning of spring a beardless, and if possible one-eyed, buffoon was set on an ass, a horse, or a mule, and conducted in a sort of mock triumph through the streets of the city. In one hand he held a crow, in another a fan, with which he fanned himself, complaining of the heat, while the people pelted him with snowballs. After the second hour of prayer he disappeared. The purpose of the "ride of the beardless one" is obvious; it was meant to hasten the departure of winter and the appearance of summer. It seems a pretty thought to believe the "confetti" originated in Persia, in the snowballing of the harlequin by the populace, personifying the departure of winter.

In French the work will center about the reign of Louis XIV., a period which has been chosen because it is one of the greatest in French history, and one of the richest in philosophy, literature, and art. To it belongs the father of comedy, Molière; of tragedy, Corneille; the fable-writer, La Fontaine; the mathematician, Pascal; the philosopher, Descartes; the theologians, Bossuet and Fénelon; the letter-writer, Mme. de Sévigné.

We will dramatize from the life of each one of these some little episode characteristic of the man's thought and work. In this way the work of the whole school will be correlated in the carnival. For example, interest in geometry will be deepened by a representation of the child Pascal discovering on the window-pane with a piece of charcoal the relations of the lines of a triangle.

Descartes will be shown burning his treatise on "The World," because he feared he would meet the fate of Galileo, and thought that he must live for the man that was not yet born. La Fontaine will be followed by a little train of children, each one representing a character in his fables.

For the La Fontaine procession, see Grade Outlines. The High School is reading and dramatizing *La Belle Nivernaise*, by Daudet; *Quatre Vingt Treize*, by Victor Hugo, and memorizing poems by Beranger and Lamartine.

The February number will contain the libretto of the carnival, which will form the basis of the French reading lessons for January. Teachers wishing to use it for reading lessons may obtain it in leaflet form from the Book Room of the Institute.

Music

Helen Goodrich Bertha Payne

The commonly accepted standard of choice for music for children seems to be below that of literature and pictorial art. We have arrived at a point where sensational literature and sign-board art are out of the question in good schools; but a similar grade of music appears on all sides without what would seem like an adequate protest. The fact that there exist standards for music corresponding in essential respects to those applied to literature and art needs emphasis. To discriminate between merely pretty, harmless music and that having positive inspirational quality and a pure, childlike spirit is perhaps not easy; but to perceive the difference between a very low grade and a very high one is not so difficult, if the same taste and judgment is exercised as in departments where discrimination is a more general acquirement. It is usually considered, for instance, that "go" — precise, stirring rhythm — is the one thing needful for a march; the physical alone is considered. Now the first requirement for a quick, orderly march is, of course, quick, exact coördination of muscles; and this may be said to depend entirely upon the stimulation of obvious, exact rhythm in the music, together with a stirring spirit which cannot be analyzed or described; but the second and hardly less important consideration would seem to be the subtle reflex effect upon mind and heart. There is a lack of economy apparent in a march which develops day after day only the physical side, and fails to place before the child at the same time appropriate emotional qualities embodied in a logical, well-proportioned, and beautiful musical form.

And yet we hear on all sides — for physical culture, for marches, for dancing — a kind of music which has, without doubt, a tendency to confuse the mind by its lack of form, and to vitiate the taste by its lack of distinct and ennobling character.

It is sometimes urged that only the musical children are affected by the music in any other than the most superficial way, that only the rhythm is important for the majority. This may or may not be true. Children accustomed to hearing nothing but a disconnected series of sounds on the piano, instead of musical ideas expressed in beautiful musical form, cannot be expected to have much discrimination; but granting that is true, the musical children and those accustomed to hear good music feel the influence, and the rest are missing their possible opportunity for development.

There is, moreover, much doubt about the lack of influence of music for good or evil upon even the so-called unmusical children. A few experiments could be made by having some pianist who can bring out the spirit of different kinds of music play for the children to dance by, in their own way. "Rag-time" calls forth "cake-walk" movements invariably; and equally vigorous and rhythmical, but refined, music results in refined movements.

The general character of the instrumental music in schools is to be seriously criticised. It consists of a rather narrow range of pieces, chiefly "two-steps" and "rag-time," a kind of music associated with the vulgar or sentimental or trivial ideas of the typical street-song; this is drummed upon the children's nerves day after day, often with the pedal held down continuously, thus producing an indescribable din and jangle. The piano is reduced to a very low level indeed; its possibilities of clear and beautiful expression are lost in a blur of inaccuracies.

The music published in this number of the magazine was used for two of the processions in the Thanksgiving exercises. *La Sylphide*, which has a graceful, flowing rhythm in ¾ time, was played for the procession of Greek maidens. It presents a light, steady, perfectly-balanced onward movement. A simple dance step, accompanied by lateral arm-movements, suggested itself to the pupils, the extremes of the arm-movements being accommodated to the first beat of each measure. The balance in the rhythm for the feet is preserved in the ¾ time, the accent falling to the left and right foot alternately; i. e., (left) 1-2-3, (right) 1-2-3. The piece must be played very smoothly and evenly. It was found useful in the Kindergarten for "the thread," "the stream," and similar rhythmical plays. It has no characteristics which might unfit it for these purposes, though ballet music in general could not be recommended.

The *Gavotte* by Reinicke was used for the Greek children, who came singly down the middle aisle of the gymnasium, dressed in short white tunics, wreathed with colored leaves, and bearing baskets of fruit and flowers. They were supposed to be on the way to a sacrifice to Bacchus, and the music was selected as reflecting the gay, child-like spirit of the scene. The marked frequently-recurring accent, with the suggestion of a glide on the last half of the measure, was quickly appreciated by the children. The lightness and delicacy of the Gavotte, its grace and childlike spirit, had a perceptible influence upon their action. For the priest of the scene the *March Religieuse* from Mozart's *Magic Flute* (see Collection Litolff, Marsch-Album, No. 975) was played—a simple, serious, and dignified march.

For the English Harvest Home, Spindler's well-known *Polka* was played, and in this connection gave a sense of spirited rustic merriment which added much to the scene. The first beat of each measure receives marked emphasis.

Wherever a pianist is available who can reproduce the spirit of the music for children by Schumann, Reinecke, Jensen, Hiller, Lichner, and Gurlitt, there is a supply of the most varied and lovely material for all occasions demanding piano music, excepting the marches. Names of good ones have been printed several times in the COURSE OF STUDY, and further lists will be added from time to time.

Pedagogic Class

This class will continue its work in song study and singing, with class work in breathing and vocal exercises given as incidental help. We find still that the class work in vocal drill is of very little

value in overcoming defects in the use of the vocal organs, and for this reason the individual help is still given upon the plan begun in October. The results have been so good that this work will be carried on throughout the course.

In these personal consultations the students are now grouped in twos and threes, so that each may be helped by listening to the voice of the other, noting the deviation from pure tone, searching for the cause, and watching the effect of the remedial exercise given by the teacher. Several members of the class are now ready to be of real assistance to others in the practice periods. This plan involves much more than vocal drill and more than ear-training, though that is an important part. The students become much keener in the discrimination of pure tone, quality of tone, accuracy of attack, and of pitch. Keenness of discrimination, however, is not the end, but is sought as a means toward helping oneself and others to attain full control and use of the beautiful human instrument in expression.

We have found in these lessons that many faults of throat tension and stiffness in jaw and tongue have been helped, but that the fundamental and difficult thing is to obtain firm diaphragmatic breath control. This once gained means immediate help in the other difficulties just mentioned. We therefore repeat the emphasis before laid upon its importance. The breathing exercises outlined in previous numbers are all that are necessary, but some further directions are given for their use:

I. Clothing must not be tight at the waist.

II. Chest must be kept well-filled but not tense; easily active but not lifted with muscular effort at each inhalation.

III. Inhalation for singing taken with attention concentrated upon direction of air to the lowest part of the lungs.

IV. Breath taken quietly, with steady effort that is felt at center of front of waist in the form of an *inner tension*. This causes apparent but not sudden pressure outward at the point toward which breath is directed.

V. Resonant tone: Follow this kind of inhalation by singing vowel *o* — long, on a middle pitch (*g*, *a*, or *b*). Direct tone to lips while singing; *keep up feeling of waist expansion felt during inhalation*. This fiction of taking breath while in reality giving it out results in:

1. Retention and economy of breath.

2. Use of full chest cavity to increase volume.

3. Relief of wrong throat tension, in which strain comes upon throat in effort to sing a high note, or when breath is nearly gone, by sympathetic action of throat muscles about the larynx.

4. The direction of breath to lips secures additional resonance from bony cavities of head and contact with hard palate.

VI. Repeat exercise on vowels ee, ā, ōō, āh, being careful to keep tongue relaxed.

The study of children's songs will be continued, and a discussion of music needed for gymnastics in rhythmic games and in marches will be taken up. This will be in direct preparation for the direction of children's games.

Songs. Text considered alone.

1. Imagery involved; familiar ideas built upon experience of children.

2. Images brought into new relations.

3. New relation involves an arrangement that is pleasing. Ideas aroused have a distinct "feeling tone."

Relation of fact and poetic element.

4. Childlike simplicity of ideas embodied. Distinction between childlikeness and childishness.

5. Form of meter; true to its type; clear or confused. Lines short or long: which are best in child's song?

6. Reasons on psychologic side.

7. Study *Christmas Carol*, E. Smith, in First Book, Modern Music Series, p. 128. Compare with *Garden Song*, E. Smith, in Songs for Little Children, Vol. II, as study in form; effect of long phrases.

Text and Tune.

1. Agreement of words and melody. Is meaning of words emphasized or blurred by its musical setting?

2. Adaptations of words to texts not composed for them.

3. Rhythm and Meter; relations between the two.

4. Unity of sentiment between words and music.

5. Collect and bring to the class songs that seem to you to be especially good in this agreement between words and music, both in sentiment, mood, and in accent. We find that texts demand music of distinct character. What have the elements of pulsation, variation of pitch, and combinations of tones in chords to do with this character? Since pulsation in the form of rhythm is a most important element as a stimulus to movement, we will study that essential first.

Rhythm.

1. Physical basis: What are the necessary rhythms of life? of action? tactual and auditory stimuli that arouse rhythmic images?

2. Experiment with watch, metronome, and with the sounds caused by the revolutions of train wheels. Do they group themselves? If so, in what forms? Can you vary these forms at will?

3. Does the rhythm possess you, or do you control the rhythm?

4. Reproduce these rhythms in measure, in periods.

References: Titchener, *An Outline of Psychology*, p. 172; Wundt, *Human and Animal Psychology*, p. 262; Scripture, *The New Psychology*, p. 13; Fiske, *Outlines of Cosmic Philosophy*, p. 299; Lanier, *Science of English Verse;* Bolton (monograph); Froebel, *Education of Man*, Sec. II, p. 70; Richter, *Levana*, p. 162.

Physical Training

Carl J. Kroh Caroline Crawford

The interdependence of mind and body is best exemplified by those studies which involve action, observation, and representation. Wherever this has supplemented the unrelated methods of old, mind and body training may be said to go hand in hand, as in the case of the numerous forms of manual training.

Physical training, gymnastics, through its education of the neuro-muscular organism, reinforces all the modes of expression. To strengthen the attention and memory by exercise in "doing" is to strengthen the idea. Our motor experiences become our mental experiences, emphasized in many ways through our sense-perceptions. Perceptions of weight, distance, and resistance, for instance, are primarily acquired through the study of our own movements. Later, these perceptions are applied in movement-forms of a more complex nature, required in our daily pursuits. Properly directed effort thus enables us to use our muscular system in an efficient way; motion and locomotion are economically adjusted and the paths of least resistance are established.

Naturally, the child has already developed the fundamental movement-forms, regarded as the basis of all specific training. New co-ordinations are now required, and the importance of appropriate procedures, conducive to correct habits of action, is constantly emphasized. This distinctly educational end is dependent in many ways on functional improvement. It implies the improvement or maintenance of health. Hygienic and educational ends cannot be disassociated.

The order of the development of the nervous system, the principal factor in education, and its ability to receive and hold impressions and to record effects, in a measure determine the characteristic procedures of rational physical training. Direction in gymnastic training, therefore, to become duly effective, must be in accord with certain pedagogical principles. It

must conform to an elementary order. The pupil's ability to do must not be exceeded through premature demands for precision, accuracy, strength, or skill. To become nerve-stimulating and interesting in its order and development, action must be so planned that the cultivation of the volitional powers may proceed without the retarding influences of fatigue.

As success in manual training depends upon the exactness of the measurements, the correctness of the constructive design, and the accuracy of co-ordination, so success in gymnastics, which implies a better adjustment of the whole muscular organism toward accurate, quick, and skillful response, depends upon the most careful attention to the details of progressive development.

As each movement-form in itself represents a mechanical problem, attention at first must be concentrated upon it alone. The order of procedure must be natural, the sequential development logical.

One of the first studies during the past quarter involved tests of control. A newly organized school met for the first time. The classes moved from place to place in an orderly manner, but without the characteristic dispatch of purposeful movement. In the Pedagogic School, marching, therefore, was proposed as a topic, and the order of its development attempted in practice. Rhythm in uniform forward movement was regarded as the first requirement, the order of development being from slow to moderately fast rhythm. To insure uniform halting, the step was next considered. Uniform movement, rhythm, and step attained, halting was practiced. Halting from marching on place (marking of time), requiring, as it did, less control, there being no momentum to overcome, although the exercise was classed as volitional and not reflex, was considered a preparatory practice to halting in movement from place. Change of direction was practiced in the same way by facing on place, then in connection with movements on and later from place. The complete exercise was finally repeated in running.

Springing or jumping exercises were practiced in a like manner. Jumping from a starting-line, standing, to command and without special direction, preceded the special practice of "start" and "landing." Good form in execution invariably determined the next step.

In a discussion of details of execution this order was reaffirmed in an interesting manner. The first interest of a class of pupils in marching exercises was recognized in the attention aroused by the regularly recurring step. The pleasurable satisfaction which came with the fairly well-marked execution of the alternate slow and moderately fast rhythmic movement was augmented when the halting to command was accomplished equally well, although the distances between pupils became deranged. The adoption of some mode of halting seemed advisable. This again necessitated practice. In the beginning the class had to be cautioned before the command to halt could be executed. Inhibitive impulses varied. Attention! Halt! was spoken on the right step, the left foot was advanced and the right foot placed next it without overstepping. In this way ample time for stopping was allowed and uniform halting became possible. In the upper grades the direction to halt could now be given with either step, and later instantaneous halting, left or right, was successfully attempted. The repetition of this practice in running required a high degree of control and was possible only with the High School boys, and then only when specially signaled. The practice of facings and movement in different directions, of modes of move-

ment, forward, sideward, backward, followed in quick succession.

Helpful suggestions were made. The time required by the different classes to cover the distances from the class-rooms to the gymnasium or play-grounds, for instance, was ascertained through a comparison of steps and seconds. The design of a running course was preceded by interesting number work. Number work was also correlated with the study of ventilation. The gymnasium, locker, and dressing-rooms were measured, and heights ascertained by triangulation. This led to an estimate of the volume of air in the different rooms, to tests of individual breathing capacity, and to a calculation of the air needed in the respective rooms. (See Grammar Grade outlines in December COURSE OF STUDY.)

Jumping without direction at once revealed the steps to be followed in practice. Pupils jumped from the board upon the mats awkwardly, without yielding, on the whole foot, etc. To obviate this difficulty, attention was directed to the execution of the foot and leg exercises alone, the arms being held in fixed positions, as with hands on hips, or placed on shoulders. Heel elevation, knee-bending, landing with proper yielding and erect body, as indicated in the practice of the start, was successfully mastered; the arm movements accentuating the jumping effort were also separately practiced, and with reference to direction of jump. The combination of the various movements and their correct execution over increased heights and distances became possible in rapid and orderly work. The ill effects of faulty jumping, noise, etc., were avoided. Greater ease of movement and perceptible improvement in bearing and carriage indicated much better control.

Progress in the above practice of marching, running, and jumping forms, however, depended much on the emphasis placed on the practice of free standing exercises. Their importance as a means of elementary body-building, as well as of thorough development, is fundamental. They are invaluable as a means of preparation for the more progressive work of the gymnasium.

Marked differences were suggested in the execution of exercises by boys, as distinguished from an execution of similar exercises by girls. With boys a different treatment, both in matter and method, is required than with girls; the need of swift, tense, and strong exercises predominates; whereas with girls a slow, rounded and graceful movement, to the exclusion of all sudden and strenuous exertion, seems to be required.

Thus the acquirement of appropriate movement-concepts, gained through resolute and discreet application in gymnastics, becomes a means of reinforcing all work requiring correct observation and representation.

Answers to Questions

The question has been asked, "How do you test individual proficiency in gymnastics?" The answer is, that this testing is going on all the time. It is summed up in the final "course tests"—an inquiry into the student's proficiency in skill, dexterity, strength, and endurance. These tests embrace contests and appropriate exercises, approved and judged by the staff of the Physical Training Department conjointly with the Faculty Committee on Sports and Games. Together with the record of the student's growth and improvement, established through a comparison of physical measurements taken at the beginning and close of the school year, they reveal his rank in his class.

"Do you have recreative forms of exer-

cise, as plays or games, in connection with your regular gymnasium work?"

Yes. The indoor practice of games and plays of the Grammar Grades during October included a number of running and tag games, as "peel-away," and ball games, as "roll-ball," and "pass-ball." The outdoor practice consisted of football games. In November "dodge-ball" was played; the game of "basket-ball" was suggested. Outdoor practice of football teams closed with a contest between an upper grade team and a team from the University school.

Records in standing and running broad and high jumps, and in climbing, were taken toward the close of the month.

Indoor practice during December included practice in "basket-ball," "volley-ball," "battle-ball," and "curtain-ball." Teams of the Academic and Pedagogic departments met at various times in contests. The Grammar Grades and High School classes played "hare and hounds" in Lincoln Park, also "center-ball."

Peel-away, pass-ball, roll-ball, center-ball, volley-ball, hare and hounds, etc., are described in Vols. II–VII of *Mind and Body*. For football, see *The Spalding Guide*.

The School Museum

Ira B. Meyers

The Museum deals directly with materials used in the regular work of the school. In its relation to field, laboratory, and class-room work, it aims to aid students in selecting and arranging materials to illustrate points of class study and to afford them the advantages of materials in study.

The collected materials in the beginning consist of more or less isolated specimens, which soon begin to combine into related series; as an example, a piece of weathered sandstone, a glacial bowlder or a beach pebble may illustrate forms of rock disintegration. These accumulated specimens are arranged into a series to illustrate the action of the different agents of erosion, and the appearance of the materials on which they act; e. g., (a) weathering, (b) wave-action, (c) running-water, (d) wind, (e) glacial action.

These again separate into series showing the effect of each agency on a single variety of rock with different stages of disintegration and the final disintegrated product; e. g., clays, sands, and soils.

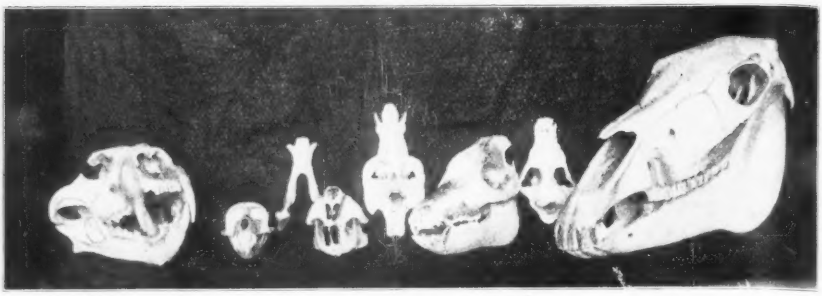
Similar collections are made illustrating some natural or industrial relation of plants, animals, or minerals; e. g.:

1. The relation of form to function in animals and plants. (See series at end of paper.)
2. The relation of color to function—insect or plant coloration.
3. Stages and processes from iron ore to finished steel.
4. Stages and processes from cotton plant to finished cloth.
5. Various commercial products received from a single natural product—coal. The seeds that may be selected from the natural and industrial world are as varied as the needs and conditions of nature and man.

Collecting demands of the student a definite purpose to insure the selection of materials that will show relationship whenever they exist.

The educational value of any material is its appeal to the observer, and in this appeal it must reveal function or force. It must reveal itself as being what it is because of its position in nature.

All materials exhibit relations of force or function, but these relationships are



LION MONKEY BEAVER HOG DOG HORSE

frequently so distributed through time and space as to remain isolated or obscure; e. g.:

1. The various phenomena of erosion, transportation, and deposition as related to soils and sedimentary rock.
2. Phenomena of plant distribution.
3. Phenomena of growth and decay.
4. Significance of form and color in animals and plants.
5. Stages of development in methods of fire-making, illumination, and heating.

One function of the School Museum is to accumulate and arrange materials that will bring together in the material itself the observations and studies of the pupils. The nucleus of this material must be selected from the mass of commonplace material in the student's environment.

Preparation of Museum Series in Dentition: (See November COURSE OF STUDY—*Physiology of Nutrition.*) The special function of teeth is to secure food and reduce it to a state ready for deglutition. Their form, structure, position, relation of upper to lower, and jaw movement are adaptations to this end. The various forms and adaptations of teeth may be fairly well represented by preparing for study skulls of cat, dog, sheep, hog, rabbit, etc.

Methods of Preparing Skulls for Study: 1. Having secured skulls, remove the fleshy portions with an ordinary penknife.

2. Place trimmed skull in an iron free vessel of water, allowing it to remain until flesh loosens from the bone.

3. Remove loosened flesh, wash skull with fresh water, and scrub with stiff brush.

4. Place washed skull in a hot solution of chloride of lime and water (1¼ oz. chloride of lime to 1 gal. water) and allow it to remain six to eight hours. (Care needs to be taken that the bone is not softened by the chloride of lime.)

5. Remove from chloride of lime solution; place it in the sun on cloth to complete bleaching. While bleaching, turn it frequently so as to expose all sides to the sun.

NOTE. When the process of maceration (just described) is not feasible, skulls may be prepared by boiling with small amounts of washing soda or chloride of lime, care being taken that solution is not strong enough to attack the bone.

For more detailed directions for preparing animal materials, see Rowley, *The Art of Taxidermy*, Appleton.

Sciopticon

SPECIFICATIONS FOR THE CONSTRUCTION

Designed by C. W. Carman

The sciopticon, or "magic lantern," working drawings of which are given herewith, is designed in such a manner that it can be constructed in the manual training room or carpenter-shop. It not infrequently happens that the teacher in a country school or small town finds that the work could be made more profitable and interesting by means of some form of projecting apparatus. The appropriation for apparatus, however, is often found to be too limited to permit of a purchase from the regular manufacturers. An enterprising teacher will find a way to obtain the few dollars needed to provide the apparatus the working drawings for which are here given.

SPECIFICATIONS. — The apparatus consists of a pine board 24 inches long and 8 inches wide. This board is supported upon two strips 1 inch square and 24 inches long. On one end of the board with pine strips 1 inch square is built a rectangular frame, 10 inches long, 8 inches wide, and 11 inches high. Extending from this frame, along the center of the board to the other end, is attached a guide for the objective support. The front of the frame is closed by an inch board, in the center of which is a 4½-inch opening for receiving the condensing lens. Grooved strips are mounted on the front as a slide-holder. The sides and rear are closed by means of woolen cloth buttoned on the frame. The objective support is constructed from sheet-iron and a hollow wood cylinder. The top is constructed from sheet-iron and can be obtained at any tin-shop. Any form of illuminant such as oil lamp, acetylene (bicycle lamp), gas, lime-light, incandescent or arc light, may be used.

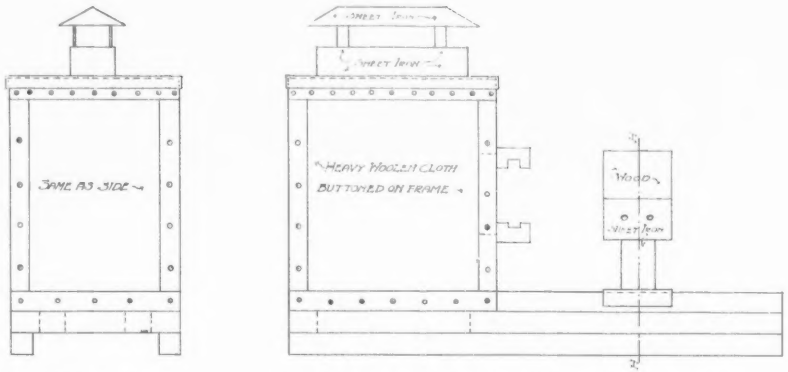
The following is an estimate of the expense:

Lumber, screws, and carriage buttons	$0.30
Sheet-iron top and objective support	1.50
Condensing lens, mounted	2.00
Objective, mounted	3.00
Oil lamp with reflector	.50
Screen, 2½ yards sheeting, 2 yards wide	.60
Total	$7.90

This apparatus may be converted into an heliopticon for the additional sum of $5.00.

Other forms of illuminants may be obtained at the following prices: Acetylene outfit, $16.00; lime-light burner, $6.00; incandescent electric lamp, $2.50; incandescent gas burner, $1.00; arc light, $8.00.

The form of illuminant to be used depends upon the locality in which the apparatus is to be operated. Electricity is the cheapest and most satisfactory, if it can be obtained.



REAR ELEV. — SIDE ELEVATION — OTHER SIDE SIMILAR — FRONT ELEV.

PLAN OF TOP — PLAN — SECTION THRO H H

SCIOPTICON.

1 FOOT = SCALE.

DESIGNED BY C W CARMAN.

The Organization of a Library

Irene Warren Frances Simpson

Uniform Size of Paper: Librarians have found that in filing material and in keeping many records it is more advantageous to use slips and sheets than bound books, because they permit intercollation without disarrangement or copying. Therefore they have adopted uniform sizes of paper, also boxes and cases for filing which have been placed on the market as standard library supplies. The following are the measurements of the paper adopted:

L size (letter), 20 x 25 cm.
N size (note), 12½ x 20 cm.
P size (postal), 7½ x 12½ cm.
V size (vignette), 5 x 7½ cm.

Folios: Folios for filing notes and papers may be made of heavy manila paper, cut twice the size of the paper to be filed, folded in the middle, and lower edges pasted together so that only the upper and right sides are left open, and the contents of each folio given in the upper left-hand corner.

Mucilage: The best mucilage is the Higgins' Drawing Board mucilage, sold in jars of three ounces or more.

Ink: In library records the essential features of ink are blackness and permanency. The Carter's Koal Black and Carter's Fast Red ink have been found the best. In marking labels and guides, Higgins' Water Proof ink is used. Ink should be kept in a stand that will protect it from the dirt. The Perfect Ink Stand does this as well as any.

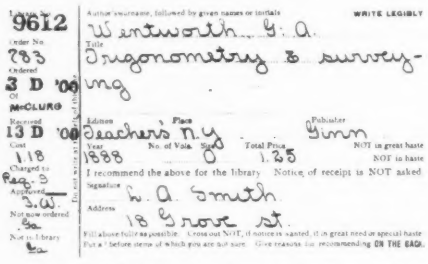
Penmanship and Pens: It is essential that the handwriting should be very plain, so that the cards in the catalog may be easily read by the public and no possible mistake made in reading records. For that purpose the library handwriting has been quite universally adopted. It is a plain round hand, with a tendency to a back slant, as seen on the sample order card. The Library Bureau pen, No. 3, is used, and a cork penholder, because it is very light and large enough to keep the hand from cramping in writing.

Guides: The guides are made of manila boards which project a quarter of an inch above the P and V slips, and are cut in thirds and fifths. They indicate the classification of material filed, either alphabetically, numerically, or by subject, as desired.

Selection of Books: The selection of books is one of the first important problems in the organization of a library. The lists of books published by librarians and educators should be carefully examined and the books best adapted to the anticipated needs of the library selected. The new books should be carefully kept up with as they are reviewed in the *Critic*, *Dial*, *Literary World*, *Bookbuyer*, *Literary News*, *Bookman*, *Literature*, and also the reviews given in the general periodicals, such as the *Review of Reviews*, *Atlantic*, and *Harper's Magazine*. Every one who is attempting to keep up with literature in general, or any subject, should follow the issues of the *Publishers' Weekly*. This gives each week an alphabetical list of the new books and new editions, with full descriptive notes, but no attempt at criticism. Notes from the publishers and booksellers, and various bibliographical information, are given. Every month a classified list of the new books arranged by subjects, is published.

It is more economical to make working

lists of books on slips than on sheets. A standard card of manila paper is used by the librarians, as shown in cut.



One book is entered on each slip. When the list is decided on, it must be carefully gone through to avoid any duplication of books. It is then necessary to go through the list again to see that authors and titles are correct, and to make selection of the best editions and to get the list prices. Every publisher will send his catalog on application. A file of these, arranged alphabetically will be found valuable to any one selecting or buying books. They can be filed in the standard pamphlet boxes, or if funds will not permit that, tied up in small packages, carefully labeled. The publishers' catalogues are arranged and bound alphabetically in one volume each year, which is known as the Trade List Annual, and which will be found in every library and bookstore. The American Catalogue is an alphabetical arrangement of authors and titles, with bibliographical information and prices. A second arrangement is also given in a classified list of books arranged in an alphabetic list of subjects. These volumes have been printed as follows:

American catalogue, author and title, 1876.
American catalogue, subject, 1876.
American catalogue, author, title, subject, 1876-80; 1880-84; 1884-90; 1890-95; 1895-1900.

Annual numbers are printed and combined every five years into one volume. The literature of almost every country has been recorded in a manner similar to that of America.

Order: When all the necessary material has been found, the slips are then arranged alphabetically by authors, and are ready for the order which is to be sent to the bookseller. The order should be made on letter-size paper, and the list of books given in tabulated form: author's surname, title, edition of year if a special edition is wanted, and publisher. No personal notes should be written on the same sheet as the order, because many booksellers keep orders and correspondence in separate files, and the order must be sent about with clerks to pick out books. A duplicate copy of every order should be kept in the library.

Receipt of Books: When the books are received, they should be checked with the order and date of receipt added. If order cards have been used, the date of receipt and cost may be added, and they may be filed to form an alphabetical index of authors of books in the library. The books are then ready to be entered in the accession book, the description of which will be given in the February number.

Home Economics

Alice Peloubet Norton

Pedagogic School

The work of the first quarter has been devoted to obtaining a general view of the food question, and gaining familiarity with the different food principles. The next quarter will be given to a study of special foods and foodstuffs. The topics discussed will be the composition and food value, the cost, digestibility, and cookery of each food material. Different methods of preservation of food, and the common adulterations, with simple tests, will be

touched upon. Some work in dietetics will be given, and toward the end of the quarter methods of teaching cookery, with the subject-matter to be presented, will be discussed. During the quarter different members of the class will be asked to report on certain assigned topics.

The foods which will be studied in January are milk, cheese, butter, eggs, and meat.

References: U. S. Farmers' Bulletins: *Food, Nutritive Value and Cost*, No. 23; *Souring of Milk*, No. 20; *Meats, Composition and Cooking*, No. 34; *Fact about Milk*, No. 57; *Milk as Food*, No. 74; Richards' *Food Materials and Their Adulterations*.

Cooking in the Primary Grades

Flora J. Cooke

On account of the necessary delay in securing a properly equipped room for the simple cooking of the primary children, it has been impossible to carry out the work as outlined for this department in the COURSE OF STUDY for October, November, and December. The children have planned, made their cook books, entered their accounts and recipes in them up to date, and made a fair beginning in each phase of the work. To take up the study of a new food in January, however, would be to leave the children needlessly unsatisfied, and many of the problems which they have been working upon unsolved. For instance, they brought to school the best cooking apples that the market offered, and by cooking each in the same amount of sugar and water, they tried to decide which was really the best. This and many other questions equally interesting to them they were unable to settle during this month.

We shall, therefore, continue the work upon fruits, cereals, and sugar through January, allowing the children to discover all they can from their own standpoint under the motive of trying to serve some simple food in the best possible way to their guests at luncheon. The teacher's effort will be to direct the efforts and provide the best possible conditions for the independent work of the children.

Number: Incidentally, in the work already done, the following units of measurement have been functioned through their use: Pound, half-pound, quarter-pound, quart, pint, gill, one-half cup, one-quarter cup; eight tablespoonfuls of thin liquid equal to half-cup. Each normal child is required to do all his necessary measuring and weighing so that his results are the natural outcome of his judgment and accuracy in measurement. His own criticism of his product is the only stimulus necessary to careful work.

The recipes used during this month will be given in the next number of the COURSE OF STUDY.

Mathematics

George W. Myers

Pedagogic School

The work of the Pedagogic School will be directed toward the teaching of the continent of North America. This will be done through the aid of the following:

Exercises: 1. Estimate the length, breadth, and area of the Institute playground.

2. Measure and determine its length, breadth, and area.

3. Range out and establish an east and west

line across Lincoln Park, just north of the Academy of Sciences. As a preliminary—

a. Range out and measure at least three times a line not less than 500 feet long over level ground.

b. Range out and measure a line at least 300 feet long over rough ground, the line being obstructed by lagoons, hills, and buildings.

4. Make a preliminary topographic map of the part of the park lying south of the east and west line of Exercise 3.

a. Plot on the map the positions of buildings, monuments, lagoons, large trees, etc.

b. Draw contour lines, and represent roughly all shore lines, street lines, and buildings in proper positions with reference to the meridian.

c. Represent on the map both the geographic and magnetic meridians.

5. By a more careful survey make a more accurate map embodying the same data as above.

6. Estimate, then measure by the rough method of the plane table, and finally by more accurate surveys, the area of the suggested tract.

Applications

Obtain a large and accurate map of Illinois, containing as much detailed information as possible. From this map answer the following questions:

1. How long is Illinois in degrees and in miles?

2. How broad is it in degrees and in miles?

3. What is its area in acres and in square miles, as determined from the map?

4. What is the length and bearing of the longest line crossing the State?

5. What is the length and bearing of the line giving its greatest breadth?

6. What is the breadth of the State in degrees? What the length?

7. Using the number of degrees in the lines giving the greatest length and breadth of the State, and the number of miles in the lengths of these lines, ascertain the number of miles in one degree in each case.

8. Account for the difference in the number of miles per degree in the two cases.

9. From a contour map find the highest point of the State. The lowest point. What is the difference?

10. What would be the difference of the barometric readings at these two points?

11. From a map of North America study the same questions as are asked above for Illinois.

Astronomy

1. What is the inclination to the horizon of the solar rays in Chicago on the 1st and 15th of each month of the year at apparent noon? Answer from observation.

2. Between what limits does the inclination vary during the year?

3. What is the cause of this variation?

4. Answer Question 1 from inference for Cairo, Centralia, Peoria, Quincy, etc.

5. How do the inclinations for corresponding dates differ for the suggested places? Explain the difference.

6. How much more heat does a square meter of the earth's surface at Chicago receive in a given time on June 21st than on March 21st? Than on September 21st? Than on December 22d? Answer from observation records.

7. Answer same for Cairo from inference.

8. When is the sun's diameter, measured with the sextant, the larger, in June or in December? (The sextant and its use explained.)

9. What does this indicate as to the distances of the sun from the earth on these dates?

10. Can you determine how much more heat a given surface receives when the sun is nearest than when it is farthest away?

11. Can the varying distance of the sun from the earth account for the difference between the amounts of heat referred to in 5?

12. How is the inclination of solar rays connected with the amount of heat received from the sun?

13. Is the varying inclination of the rays capable of explaining the fluctuation in the amount of heat received in Chicago in summer and winter? Compare with answer to Question 5.

14. On what great circle of the sky is the sun always located at 6 a. m., apparent solar time? at 12 m.? at 6 p. m.?

15. How do the sunset and sunrise points move from day to day during the year? Why do they move so?

16. How would these points seem to move to an observer in southern Florida? in northern Alaska?

17. Does the sun ever shine on the north side of a building in this latitude (42° N.)? Why?

18. What would the diurnal path of the sun be to an observer on the Equator on the following dates: March 21st, April 5th, April 21st, etc., throughout the year?

19. Answer the same question for an observer on the north polar circle. On the north pole. On the south polar circle. On the south pole.

20. How long does it take the sun to move from the Washington to the San Francisco meridian?

21. Explain the system of time belts on which Standard time is based.

22. Extend your arm in the direction of the apex of the earth's way at sunrise, noon, sunset; at midnight and at intervening times.

23. If you were standing at this moment at Port Mulgrave, Alaska (Lat. 59° 34′; Long. 139° 46′), where would the sun seem to be at noon to-day?

24. About what is the sun's declination to-day?

25. About what is the siderial time at this instant?

26. How can you easily estimate the approximate values of the sun's declination and of siderial time for any day of the year?

27. Indicate the moon's diurnal path across the sky to-day as it would be to an observer in Chicago; in Denver; in Key West, Florida; in Port Mulgrave, Alaska. (See the American Ephemeris for moon's declination).

The Preparation and Use of Reading Leaflets in the Primary Grades

Flora J. Cooke

In the former numbers of the COURSE OF STUDY the plan of using all the appropriate reading books in the school library has been fairly discussed, but the explanation of the construction and purpose of the regular series of leaflets which are printed each month has not been fully presented. The motive of these reading lessons is to relate more closely the school experiences of the children of the First and Second Grades with the rest of their lives and make their reading react directly upon their actions. To illustrate these points one typical reading lesson has been selected to represent each month of the quarter.

We have been asked to prepare such reading lessons in advance, so that the readers of the COURSE OF STUDY may use the leaflets as supplementary reading during the same month that they are being used in the Chicago Institute, as many of them are related to the great festivals of the year, such as Thanksgiving and Christmas, and are not of as great use later in the season.

It seems impossible in many cases to do this if the reading lessons are in any way to sum up the observations of the children and are to be the outcome of their work. In such cases as the story of the first Christmas tree or the Janus myth, they can always be prepared in advance in time for use in the COURSE OF STUDY, but in the lessons on the farm, for example, it would be impossible to foresee and prepare the reading lesson at the beginning of the month. The notes on the farm and the Pilgrim reading lessons are merely suggestive, and do not represent a fixed method of work or form of expression. The effort is to use whatever form seems best adapted to arouse the desired images most economically and clearly in the children's minds.

At the end of the year these leaflets will be classified by the children and bound in book form, and become their personal property.

The farm reading lesson which is printed below is the result of a field excursion taken by children in the First Grade of Chicago Normal School in 1898.

The children of the Chicago Institute went to a farm at Lake Bluff October 2, 1900. The reading lesson summing up the experiences of that day would be quite

similar to the one given here. This one is selected for the following reasons: As they read this lesson, the children will compare their own observations with those of other children at another farm in the vicinity of Chicago and note how the two farms are alike and how they are different. The fact that other children may read their stories will be an added stimulus to the desire for good form and clear expression. The necessity for the printing of such records is also made obvious in this way. This farm reading lesson was prepared in the following manner: Each of four groups of children told what they saw and what they liked best at the farm. The teacher wrote each child's summary upon the blackboard, with the help of the other children, and when they were all satisfied that they had told all they wished to, she edited the whole account as dramatically as possible, adopting the style which seemed best adapted to sustain the interest of the children. Their motive in reading this lesson after it was printed was to live over again the day and see if anything was left out, and finally, to see if they thought their mothers and the children who could not go with us would enjoy reading about the trip.

The children drew or suggested in every case whatever illustrations they thought would make the lesson clearer to the people reading it.

The use made of the reading lessons in the grades where children are only beginning reading may be illustrated in the story of the Pilgrims as follows: In its preparation, the teacher first gathered all the data possible and prepared a series of word pictures which set forth the story, or rather the special points of the story, which had been selected for emphasis in this grade. How much the children actually read of the story depended entirely upon their interest and attitude in reading it. The teacher told much of the story to the younger groups, writing such new words upon the blackboard as were to be constantly used in this work. She was careful to write these words at the time of greatest interest, so that they might be functioned by the children with as little conscious effort as possible.

When she had reached a specially interesting point, she sometimes said: "The rest of that story is here on this leaflet: find out what it says and tell us on the blackboard."

This did two things for the children:

It rested them by allowing them to be physically active, and the demand for expression required the clearest mental imagery. The teacher was careful here that the child did not at first meet too many obstacles, so that over-strain and discouragement came in. The thing considered in all cases was the child's attitude toward the reading. It has been our experience that when a real desire for reading has been awakened, the children have not been willing to stop until they have read the entire leaflet for themselves. We have found that it is time saved not to have much oral reading before this stage is reached, but to place all the effort upon making reading worth while from the child's own standpoint. In the December lesson we have only another phase of the Christmas experience, which seems to need no further explanation.

At the end of January we hope to sum up that month's work in several reading lessons, but these cannot well be printed in time for use during that month in schools outside Chicago for reasons already given. The leaflets which follow cover the subjoined topics:

1. Representative lesson for October.
2. Representative lesson for November.
3. Representative lesson for December.
4. Representative lesson for January.

Reading Lessons for the Primary Grades

Science Series, No. 1

Flora J. Cooke

Reading Lesson on the Farm at Thornton

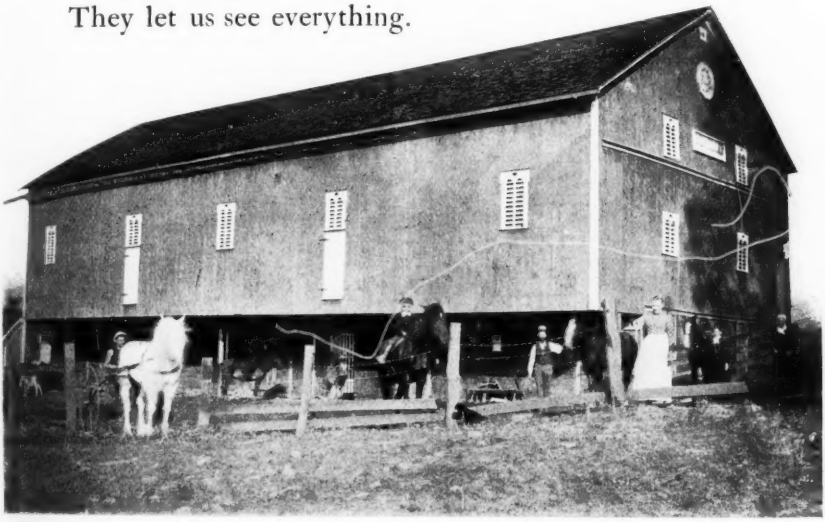
October 2, 1897, we went to visit a farm.
It was a beautiful day.
There was a deep blue sky above us, with not a cloud in it, and cool, fresh air around us.
We had bright sunshine all day long.
"The nicest day of all the year!" said Fritz.
The farm we visited is 15 miles from our school.
It is on Halsted Street.

We might have gone all the way in wagons, but that was too slow for us.
It only took us 42 minutes to go on the train.
Then we were only one mile and a half from the farm.
Big hay-wagons were waiting for us at the station.
Oh, what fun we had going to the farm!

We passed a big limestone quarry.
We wanted to see it, but we could not stop for that.
We passed some beautiful oak woods.
We wanted to gather leaves, but we could not stop for that.
We passed a great yard full of horses and colts.
We wanted to watch them, but we could not stop for that.
We passed cows and calves, goats and little pigs.
We saw old hens and chickens, and a big, proud peacock.
But we could not stop for any of these things.

They needed our horses at the farm, you see.
After a while we came to more beautiful woods.
We heard turkeys gobbling.
We saw a red brick house.
We were at the farm.

The people at the farm were very kind to us.
They came out to meet us.
They let us go everywhere.
They let us see everything.



We went first to the horse-barn.
We saw each horse go into his stall.
They were fine, large horses.
They were black, white, and brown.
Some of us liked the white one best.
Some liked the big black one best.
In each stall was a manger full of hay.
We saw the horses fed and watered.
We saw them hitched up for work.
The man showed us how he kept the horses clean.
He combed their hair with a currycomb.

One boy said, "I am glad my hair is not combed that way!"
The man showed us the hay-loft full of hay.
He showed us the oat-bin full of oats.
Then we went to the cow-barn.
The cows were out in the cow-yard that was back of the barn.
There were 25 cows in the yard.

In the barn was a little black and white calf.
It was only two days old.
Its mother was in the yard.
She kept calling it.
It always answered her.
Moo! moo! said the old cow.
Maa! maa! said the little calf.
We wanted to stay and watch him, but there were many things to see yet.

We had to go on.
We saw all the food for the cows.
There was ground corn, and oats.
There was plenty of hay and corn fodder.
Corn fodder is the dry stalks and blades of corn.
We saw the stalls where the cows were milked.
They were not like the horses' stalls.
There were no mangers in them.
There were slats to hold the cows' heads straight.
Why do people wish to hold the cows' heads straight?
We saw much straw for the cows' beds.
In summer the cows sleep out of doors.
Then we went to see the pigs.
They grunted and squealed when they saw us.
"Give us something to eat," they said.
We ground corn for them in the corn-grinder.

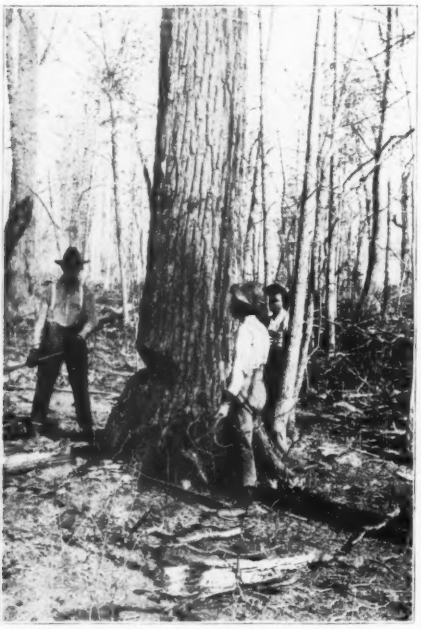
We fed them some of our lunches.
Still they grunted and squealed.
Pigs never seem to know when they have enough to eat.
They would eat all the time, I think.

Here is a flock of sheep.
A man drove them up the lane into this field.
They all followed their leader.
Can you see the black sheep in the picture?

Then we went to see the machines.
There was a shed full of them.
There was a ground-roller.
We rode on that a while.
There was a drill to make holes for the seeds
There was a hay-rake and corn-cutter.

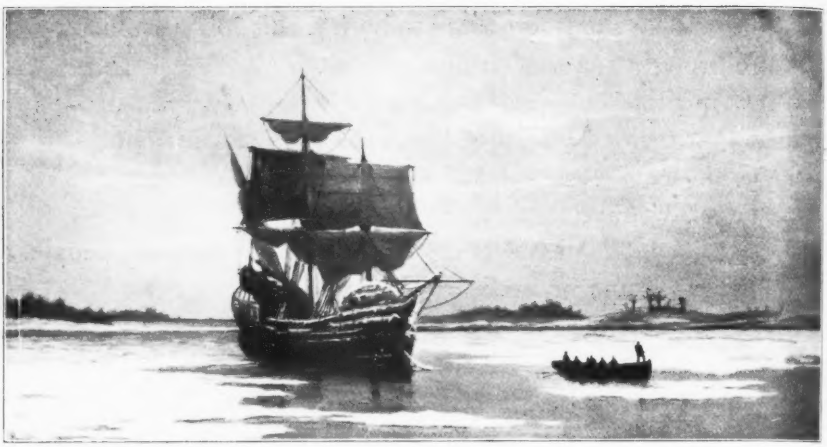
There were a great many other machines, but we did not see them used.
Then it was noon.
We sat down outdoors to eat our lunches.
Some of us sat on pumpkins on the porch.
Some of us sat under the trees.
It was nice to look up at the blue sky.
We had to look out through the red and yellow leaves.
There was a large woods across from the house.
Oh, there were such pretty leaves on those trees!
The oak leaves were purple, brown, and red.
The maple leaves were bright yellow.
The pines were deep green.
After lunch we ran over into the woods.
We played games and climbed trees.
We filled baskets with acorns for Bunny, our squirrel.
We gathered pretty leaves to take home to mother.

We saw a man cut down a pine-tree.
First he cut a notch all around with his ax.
Then he cut in deeper and deeper on one side.
Down came the fine tree.
We wondered why he cut it down.
One boy said, "It 's for a Christmas tree."
Do you think it was?
Another said, "O, they want to get the pineapples."



He thought the cones were pineapples.
That was a joke. Do you know why?
We went to see the man plow a field.
It took three horses to draw the plow.
The plow-knife was round like a wheel.
It cut through the sod.
The plowshare was behind the wheel.
It was made of bright steel.
It turned the soil over.

It was a long, long field, but we went to the end of it.
The soil by the house was sandy, but this soil was black.
We brought some of it home.
It is not like our garden soil.
At four o'clock we all got into the hay-wagon again.
"Good-by, pretty woods," said one girl.
"Good-by, nice farm," said another.
"Good-by, and thank you," we all said to the kind people.
Then we came home.
Was it not a pleasant day?



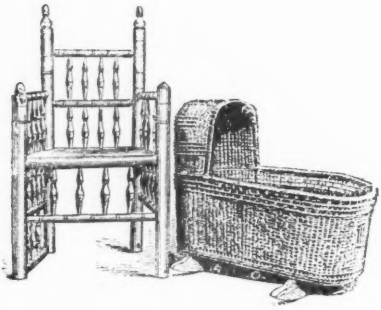
The Pilgrims

History Series, No. 1

The Pilgrims were a brave people.
They were good.
They wanted to do what they thought was right.
They wanted to govern themselves.
The King of England wanted them to obey him in everything.
So the Pilgrims left England.
They came across the great ocean.
They came in a sailboat called "The Mayflower."

One day a great storm came.
All the sky was dark.
The great waves dashed over the Mayflower.
A beam broke.
But the brave Pilgrims did not lose hope.
They did not turn back.
They fixed the beam with ropes.
They sailed on.

Miles Standish was the Pilgrims' captain.
He was brave and strong.
Which do you think is his picture?
Priscilla is in the picture, too.
She was very kind and brave.
She did many things for the Pilgrims.
She took care of the sick and the children.
She could spin and cook.
She could sing sweet songs.
She could tell good stories.
All the children loved Priscilla.
One day a baby was born on the Mayflower.
His name was Peregrine White.
Peregrine White looked like any other baby.
He could eat and sleep.
He could cry and crow.
He had such a queer cradle.
It is very old now, but we saw it at Plymouth.



It looked just like the picture you see here.
The Pilgrims were on the ship a long time.
There were many dangers.
The Mayflower was not a strong boat.
The great waves tossed it about.
It was very cold, and many were ill.
Often they could not tell where they were going.
At last they saw land.
It was America.
They came into a quiet bay.

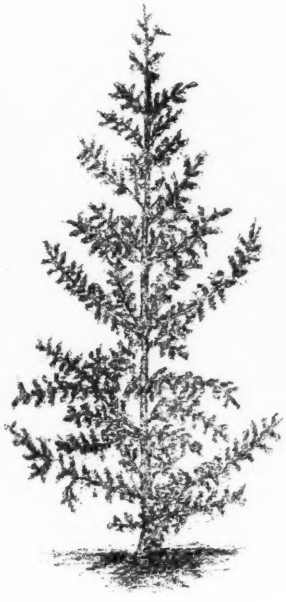
They saw a great rock on the shore.
They called it Plymouth Rock.
Here is a picture of the way it looks now.
They landed here.
This was in December.
There was snow on the ground.
The Pilgrims saw bare trees and a gray sky.
They saw no houses.
They saw no people, except a few Indians.
At first the Pilgrims lived on the Mayflower.
The Pilgrim men cut down trees.
They built log houses.
The women and children helped them.

They had little to eat.
Many became ill.
It was a long, sad winter.
One day an Indian came into the village.
He said, "Welcome, Englishmen."
This Indian was Samoset.
The Pilgrims were kind to him.
They gave him beads.
They were red, blue, and yellow.
Samoset thought the beads were beautiful.

He went away, but he soon came again.
He brought Squanto with him.
Squanto was an Indian chief who had lived in England.
He could talk to the Pilgrims.
He was very kind to them.

The Pilgrims had found corn buried in the earth.
They had never seen corn before.
Squanto showed them how to plant it.
Squanto and the Pilgrims feasted together.
They were always good friends.
This made the Pilgrims much safer. Why?
The next year the Pilgrims had a great harvest.
They had warmer houses.
They had plenty of food.
They were well and happy.

The Indians were their friends.
They felt very thankful.
They said, "Let us have a great feast."
"Let us thank God for his blessings."
"Let us share our feast with the Indians."
They feasted and sang and prayed.
This was the first Thanksgiving.



The Story of the First Christmas Tree

LITERATURE SERIES, No. 4

Hans and Gretchen were the children of a poor woodcutter in Germany.

Their house was small and old, but it stood in the midst of a beautiful forest.

In summer the children played in the woods all day long; they climbed the trees and made vine swings. They sailed

leaf boats on the brook. They played with the small animals of the forest, and loved them. They knew where to find the first flowers in the spring and where the best wild fruit grew.

In winter, Hans and Gretchen did not always have enough to eat, but they usually had a good fire, and they were not often unhappy.

One cold Christmas Eve, after the stockings were hung, mother was telling the old story of how Christmas came to be, of the little child in the manger, the star, and the shepherds.

Suddenly, out in the forest, they heard such wonderfully beautiful music that they threw open the door in wonder. There on the steps, in the storm, blue and shivering with cold, stood a little child. They brought him quickly in and rubbed his poor little hands and feet. They warmed their breakfast porridge and fed him all he would eat. Then they gave him the very best place to sit — in mother's lap — until he fell asleep. They shared their own bed with him.

In the morning a most wonderful thing happened. Hans and Gretchen awakened, and again they heard the beautiful music.

It seemed close to their window, and when they looked out they saw, standing in the snow, the little stranger. He was clothed all in light, and many angels sang around him.

Seeing the children, he smiled and said: "When you helped the helpless you were truly helping me."

Then he laid his hand upon a young tree by the door and said:

"As a token of your loving spirit, this tree shall be ever green, and people in many lands shall hang upon its branches gifts of love and good will at Christmas time."

Story of Janus

LITERATURE SERIES, NO. 5

January was named for Janus, the king of the beginnings of things.

The Roman people never began anything without asking Janus to help them. They made pictures of him which looked something like the one given here.

You see he has two faces; one is old, for he is looking backward, and sees all the past; one is young, for he is looking forward to things yet to come.

He has a key in his right hand to open every year, and also to close it again at its end.

He locks it so well that no one can get into a year or out of it before the right time comes.

Janus also has a scepter; the Romans believed that he used it to control the beginnings of all kinds of work.

On the first day of January we say, "Happy New Year!" to our friends, and we truly hope to do only good things all the new year; but we do not ask Janus to help us as the Romans did. They used to burn incense and cakes and fruit,

and offer sacrifices upon twelve altars to Janus at the beginning of each year. Every one promised not to begin anything without asking his help, or end anything without thanking him.

This was not always a good thing for the Romans, for if a careless boy made a mistake he need not say, "It was my own fault I made a bad beginning"; but he could say, "Janus is not willing to have me do this work; he spoiled the beginning of it."

Fortunately, the Roman children had good mothers and soldiers to help them as well as Janus.

A poet tells us that Janus' motto was: "Everything depends upon the beginning." Would you take that for a school motto? Can you make a better one?

Kindergarten

OUTLINE FOR JANUARY AND FEBRUARY, 1901.

Anne Elizabeth Allen

Subject: The balance between demand and supply.

It has been truly said that the luxuries of one generation become the necessities of the next, and it is equally as true that as luxuries become necessities we cease to think as much about the source of their supply. In the commercial world, the balance between demand and supply is kept as even as possible, and the economy so learned is most easily reduced to reason with even very small children. In these two months it will be our aim to bring before the children, objectively, the needs that winter creates, leading them to see the sources of supply and the number of people concerned in making each one of us comfortable.

Their most evident need when the cold weather comes is their clothing, which impresses them most in heavier coats and caps and the necessity for wearing some covering for the hands.

Beginning in January, then, with their winter clothing and tracing it all to the most immediate source of supply, the store, we may go still farther back, first to the manufacturer and then to the sheep. The shelter our homes afford and the special means used in them for protection against wind might be our next subject, followed by the heating and lighting, observing the different means used for keeping different buildings warm and light, and finding out which is best suited for the buildings we know.

St. Valentine's Day will be celebrated, and for several days previous to the 14th of February a part of each day will be spent in the preparation of valentines. Emphasis will be laid upon the need for neatness and good taste in the selection of

colors and decoration in their manufacture, and all those made will be criticised by the children themselves as to their worthiness to be sent to friends, and as to the disposition to be made of such as do not come up to the standard.

General Topic: Our needs and their supply.

Special Topics: Clothing for winter; shelter against wind, rain, and snow; heating and lighting of buildings; reason for cold weather.

Clothing: Additional clothing for winter; tracing this clothing to the source of its supply.

Shelter: Use of walls, floors, roofs; consideration of different kinds of buildings, and their comparison; adaptation of building to function.

Heating and Lighting: Different modes of heating, such as steam, hot air, stoves, grates, gas. Necessary materials for making fires, and where obtained. Different modes of lighting—electricity, gas, lamps, candles. Most usual modes; how such lights are supplied. Cause of cold weather; observation of length of day; direction of cold wind, etc.

Songs: *Jack Frost*, Smith's Songs, Part I; *Snow-Ball Song*, Smith's Songs, Part II; *Recipe for a Valentine*, and *Jack Frost*, Gaynor Songs; *The Postman*, Knowlton's Songs; *Postman's Song on St. Valentine's Day*, Moore and Hill's Songs.

Stories: *Ted's Visit to the Fire Fairies* (published in this number of THE COURSE OF STUDY); *The Story of St. Valentine* (to appear in February number).

Games: Wind Horses; Fire Fairies; Carpenter; Jack Frost; and the dramatization of stories.

Rhythm: Skipping sidewise, and trying to interpret rhythmically any new music.

Instrumental Music: *Instrumental Characteristic Rhythms*, Part II, Clara Louise Anderson. A new book of music for use in the kindergarten, by A. D. Scammel.

Materials used: Paper and scissors for cutting pictures and patterns of clothing; clay and sand; large blocks; second, third, fourth, and fifth gifts for building houses, illustrating means of sheltering from wind, snow, or rain—first gift to illustrate movements of fire; tablets for making sides of houses, to indicate position of windows, the most openings being on the sides where the least cold wind comes from. Colored papers; tissue paper; scrap pictures and paints for the manufacture of valentines.

What Ted Saw in the Land of the Fire Fairies

The east wind was blowing the falling snow into drifts against the house, fences, and trees. Colder and colder it grew, and little Ted, who had been out playing snow-ball, suddenly burst into his grandmother's room, crying:

"Oh, I'm so cold!"

He took off coat, hat, muffler, and overshoes, stamped his feet and shook off the snow. A bright fire was roaring in the grate, and Ted lay down before it to warm himself. He began to watch the flames dancing up the chimney and disappearing into the darkness above. Picking up a stick, he lighted it and held it up the chimney, trying to see whether he could tell where the flame on the end of it went; and he was enjoying himself very much, when his grandmother called to him to put down the stick.

"Why," said Ted, "I am just playing, and want to see what becomes of the flames when they go up the chimney."

"Yes," said Grandmother, "perhaps you do; but the fire king does not allow people to play with his fairies. They are meant to do work, not to play."

"The fire king!" said Ted, as he dropped the stick into the fire: "who is he, Grandmother?"

"I've never seen him," she answered; "but he lives in the land of the fairies."

With his toes turned toward the fire, lying on his back on the warm hearth, Ted soon dropped off to dreamland, the home of the pixies and fairies.

No sooner had he reached that queer land than straight out of the roaring fire jumped a tiny little fairy clothed all in red, who said to Ted:

"The king of the fire fairies has sent for you. Will you come with me?"

Ted was up in a moment, and jumping into the fire, followed close behind the tiny little leader. The bright red road along which they traveled was very interesting. On either side was a fringe of gray moss-like ashes, and as they hurried along Ted saw the fire fairies at work by the hundreds. In one place they had a large log they were working with, which was sending up great flames and much smoke. All around the log were the blackened remains of the grass they had spoiled. In another place a beautiful house was being torn down and burned up by these little mischief-loving fellows. Again, he came to a large stove in which were many of them helping a cook get dinner ready, and warming the cold fingers and toes of a little boy and girl.

The fairy who was leading Ted went so fast that he did not have a good look at any of these things, and very soon the fairy shouted at the top of his little voice, "Look!"

Ted did look, and straight before him was a larger palace than he had ever supposed could be built.

Flames were bursting out of doors and windows, and the roar made Ted hold his ears, it was so loud.

On either side of the great front door stood a large giant whom the little fairy said were the giants Heat and Light.

Putting Ted safely on the top of a high wall, the fairy disappeared into the palace. And just at that moment a giant greater than either of the others came to the door. In a voice that sounded like thunder and shook everything around, the giant called:

"Where is the little boy I sent for?"

Ted knew then that this was the great fire king, and was frightened, but answered quickly, "Here I am!"

Then the giant said: "I have sent for you to tell you that my fire fairies are not to be played with. They never hurt any one unless they are played with and taken away from their work; then they are sure to hurt the person who disturbs them."

How frightened little Ted was as he promised faithfully never again to play with fire! He was glad when the giant, satisfied with his promise, shut the great door and disappeared, and his little guide in the bright red suit came skipping toward him, and offered to take him back home.

On the way back he found things changed. The stove was black and cold, and the people who had been warming themselves around it and getting dinner had gone away. The house was burned to the ground, and only a few sleepy fairies were showing their red coats in the gray rubbish. Where the log had been only an ash-heap remained, which the wind was carrying away. The road was no longer red, but dusty, and Ted found that he could walk much more slowly.

How tired he was! His face felt so warm, his body so stiff—and what was that noise? How much like the dinner-bell it sounded! Was that the fairy who was shaking him? A long stretch and a yawn, and his eyes flew open. There was his dear grandmother trying to get him awake.

"Did you see him, Grandmother," asked Ted.

"See whom?" she answered.

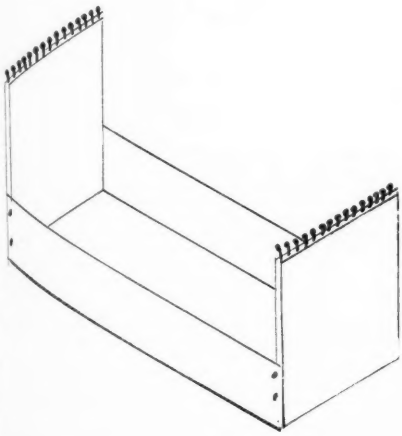
"The fire fairy," said Ted; and then began to laugh when he saw his grandmother's eyes twinkle.

"Oh! Grandmother," said he, "I have really been to see the giant king of the fire fairies, and have seen his palace and the two giants Light and Heat that guard his door." *Anne Elizabeth Allen.*

First Grade

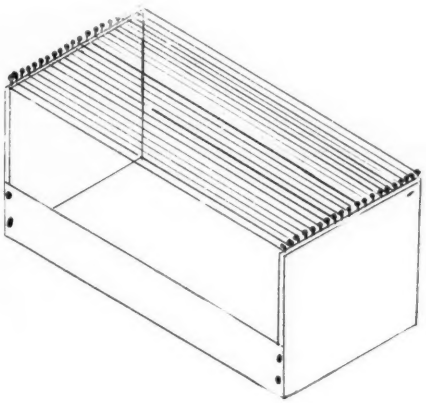
Harriet T. B. Atwood

History: Study of home activities continued. In making the floors for the different rooms of the playhouses, the children invariably chose hardwood floors for parlor and dining-room, with the idea of using rugs. The work for January will therefore be the designing and weaving of rugs to be used in furnishing the house. The children will be encouraged to examine the various rugs in their own houses and the Navajo rugs of the school museum with the view of finding out how they are made. Each child will then weave a rug upon his loom, using cotton carpet cord for warp and coarse wool filling for woof. (For the working drawing of a simple loom which can be made in the shop by First or Second Grade children, see p. 145 of the October



COURSE OF STUDY.) If this is impracticable, still simpler looms can be made by putting a row of wire nails one-quarter inch apart in either end of a wooden box and partially removing the sides of the box.

The children will also examine other fabrics, dish-towels, curtains, their own clothing, ribbons, etc., and will discover that these, too, are made of woven threads.



After examining the different kinds of threads, they will experiment with the raw materials, wool, flax, cotton, and raw silk, trying actually to make threads from them.

The children will have the advantage of seeing the spinning-wheel and loom used. (See Second Grade History Outline.) If possible, a visit will be made to a factory where rugs are woven.

Literature: Stories and myths: *The Walnut Tree That Wanted to Bear Tulips*, Sara Wiltse; *Old Pipes and the Dryad*, Stockton; *Rhœcus*, adapted from Lowell; *The Building of the Canoe*, Longfellow's *Hiawatha; Myth of Arachne*, Cooke's *Nature Myths*.

Dramatic Art: I. Training in hearing and reproducing sound. Phonic games. Dramatization of *The Building of the Birch Canoe*.

II. Poems for memorizing: *Wizard Frost*, Frank Dempster Sherman; selections from *The Building of the Birch Canoe*, Longfellow.

Nature Study: I. Study of the January landscape by means of paintings and blackboard illustrations.

II. Study of wood: During December the children experimented with different kinds of stone to discover which was best for building purposes. In January they will examine various kinds of wood as to beauty, strength, and durability.

1. Each child will have specimens of wood from the trees which he has been observing, i. e., willow, oak, pine, maple, elm, and poplar. In the shop the children will cut cross, longitudinal, and quarter sections of each kind of wood. These sections will be polished and oiled, and the children will decide which they like best for the woodwork of their houses, the floors, the furniture, etc.

2. The children will then weigh specimens of uniform size of pine, oak, and maple, and decide which wood to use to make the lightest mineral box.

3. Strength tests of the different woods will be made, as follows: Specimens of uniform size and cut (perhaps ¼ in. x ¼ in. x 12 in.) will be used. Weights varying from one to fifteen pounds (bags of sand made by the children) will be hung exactly upon the middle point of the small beam of wood in a uniform way during each test.

4. After examining various painted and unpainted wood surfaces which have been exposed to the weather, the children will experiment with painted and unpainted specimens to see which takes up the most water.

After the weight and strength of the various woods has been determined, the relation of this to the amount of yearly growth will be considered.

Geography: I. Study of various kinds of forests in connection with the work in Nature Study. Use of pictures and lantern-slides.

II. Study of tropical fruits. (See outline in Geography for Second Grade.)

Art: Painting of outdoor landscape, of various wood specimens, of tropical fruits. Blackboard illustration of stories. Illustration of one of the stories, using clay.

Industrial Art: Designing of patterns for rugs. Weaving of rugs.

Reading: Simple printed descriptions of tropical fruit trees. Printed questions upon the specimens of wood. Printed dictation for cutting sections of wood. Printed reading lessons about the various useful woods and the trees from which they come. Texts of songs written upon the blackboard.

Writing, Spelling, and English: Placing of names of the different woods, the fruits studied, and all new words learned, in dictionaries. Sentences telling the results of experiments to be written on the blackboard. Placing of recipes in cook book. Writing of dimensions on all working drawings.

Correlated Number: Making of weights to be used in testing the strength of wood. Finding the middle point of wood beams. Weighing of various wood specimens. Finding and comparison of amounts of water taken up by painted and unpainted specimens of wood. Making of an accurate working drawing of the bottom, sides, ends, and partitions of the mineral box which is to be made in the shop.

Music: (Miss Goodrich.) The music will present few new features in these grades, where many of the children are still unable to sing intervals correctly. Perfect accuracy as to pitch is secured only at certain times. Each child sings octaves, half and whole steps, and the arpeggio with great care as often as practicable—about once a week. This means, of course, very slow progress, but it proves sure as the weeks go by. These little exercises are usually taken from known songs, or those in process of acquisition. For example, the octave and third at the end of the Reinecke *Apple Tree* song, the arpeggio in the *Bogieman* (Modern Music Series, Primer), the scale-

fragments in *The Elephant*, etc., proved useful and entertaining. Very great accuracy of pitch is not demanded of the so-called "tone-deaf" children, excepting during this practice. It will be found that in many cases an approximation to the tune, sung softly by the child while listening to the teacher, may be secured long before single tones can be imitated with any security. The tone-image should be allowed to develop freely, with only now and then an attempt to reach perfection. The endeavor is made to hold the mean between too great stress upon the matter of actual pitch, which only confuses and discourages the child, and a laxity which fails to secure the concentration necessary for the preservation of the ideal.

Songs: *Spin, Lassie, Spin*, Modern Music Series, First Book; *The Spider; Work and Play; January and February; Soldier Song; Bouncing Ball*, Modern Music Series, Primer; *Old Jack Frost*, Songs for Little Children, No. 2; *The Tree*, No. 3, Eleanor Smith.

School Economics: See Miss Cooke's outline for January.

Manual Training: Making of mineral boxes for holding specimens collected by the children. Preparation of wood sections from various trees studied.

Physical Training: Apparatus work. The children have learned to vault with single bar and have started pole-climbing. Following the vault will be the hurdles. They will start with one and gradually learn to leap four.

Free exercises with music: Arm exercises and leg exercises have been taken. The next step in co-ordination will be combinations of arm and leg movements.

Games: Practice in throwing large ball, also bean-bags.

References: Carpenter, *Geographical Readers;* Sara Wiltse, *Kindergarten Book;* Jackman (outline for February and March), *Nature Study and Related Subjects;* Popular Science Monthly, March, '73, *Strength of Timber;* Popular Science Monthly, November, '82, and December, '83, *Annual Growth;* Scribner's Magazine for June, '93, *Story of Logging;* Chase and Clow, *Stories of Industry;* Emily J. Rice, *Outlines in History.*

Second Grade

Harriet T. B. Atwood

History: (ANTOINETTE HOLLISTER). The Second Grade will continue the study of shepherd life, noting especially the industrial conditions of that time and comparing them with those of our own time. The following topics will be discussed:

Mat weaving with rushes and twigs. Beating bast fibers for clothing. Use of flax plant. Discovery of fiber. Making thread of fiber. Making thread of wool. Invention of primitive spindle and distaff. Use of frames for holding warp. Modification of needle into shuttle. Use of comb. Invention of harness and heddles. Gradual perfection of loom.

Flax, cotton, and hemp will be planted in boxes in the school-room and the children will watch the growth of the plants, try to discover ideal conditions for them, and use the fibers for experiments.

They will experiment also with the silk and wool as raw materials.

A friend of the school has kindly promised to use the loom and spinning-wheel for the children, and they (the children) will also visit some factory to see the way in which cloth is made by machinery.

Nature Study: I. Study of January landscape by means of paintings each week.

II. Study of wood. (For detailed outline, see Topic II in the outline of Nature Study for First Grade.)

III. Observations in meteorology. Daily observations will be made as to the sun's position at noon and its time and place of rising and setting. The slant of the noon rays will be recorded on a shadow-stick. The work is taken up at this time on account of the interest shown by the children, during December, with regard to the long winter nights of Norway.

Literature: *The Myth of Arachne*, Cooke's *Nature Myths; Old Pipes and the Dryad*, Stockton, December St. Nicholas, '76; *The Walnut Tree That Wanted to Bear Tulips*, Wiltse's *Kindergarten Book; The Birch Canoe*, Longfellow's *Hiawatha*.

Dramatic Art: I. Dramatization of portions of the *Building of the Birch Canoe*, Longfellow's *Hiawatha*. Phonic games. Training in hearing and reproducing sounds.

II. Poems to be studied and memorized: *My Shadow*, Stevenson; *Wizard Frost*, F. Dempster Sherman.

Geography: I. Study of cotton-raising, sheep-raising, flax culture, and the culture of silk-worms, by means of many pictures and stereopticon views.

II. Study of tropical fruits which we have on our tables in midwinter. (a) Observation of fresh fruits, oranges, bananas, figs, dates, lemons. (b) Visit to Lincoln Park hothouse to see tropical plants. (c) Study of the tropical landscape by means of stereopticon views.

Art: Painting of a series of pictures to show how we obtain the raw materials from which fabrics are woven. Modeling of tropical fruits. Modeling of one bas relief illustrating one of the stories or poems.

Industrial Art: Weaving of mats, baskets, etc., in connection with work in History.

Reading: *Story of the Poplar Tree*, Cooke's *Nature Myths;* printed descriptions of tropical fruit trees; printed dictation for making working drawing of mineral box; text of songs from blackboard; printed descriptions of unfamiliar trees, the wood of which is used by man, for example, ebony, teak, sandal-wood.

Correlated Number: The making of an accurate working drawing of the mineral box which is to be made in the shop. Making of weights to be used in testing the various woods. Calculation necessary in finding the comparative weights and strength of the different woods.

Writing, Spelling, and English: Placing of new words in dictionaries. Written descriptions of experiments with the different woods. Reproduction in writing of one of the stories.

Manual Training: Making of a mineral box for holding specimens collected by the children.

School Economics: (See Miss Cooke's outline.)

Physical Training: The apparatus work and games will be the same as for First Grade. Special individual exercises will be given to correct faults in standing, sitting, breathing, etc. (See First Grade outline.)

References: Starr, *First Steps in Human Progress;* Tylor, *Primitive Culture;* Morgan, *Primitive Society;* Chase and Clow, *Stories of Industry;* Sara Wiltse, *Kindergarten Book;* Carpenter, *Geographical Readers; Frye's Geography;* Coulter, *Plant Relations;* Jackman, *Nature Study and Related Subjects.*

Third and Fourth Grades

Gertrude Van Hoesen

Geography: As one of the subjects under consideration during the past month was Food, the natural question is, Where do we get all of this food? During the month of January this will be answered as far as possible by considering Chicago commercially from the standpoint of what we import.

It is only by means of excursions to those places where the food supplies are received or stored that it will be possible to obtain any idea of the immense amount of food received in Chicago every day.

1. An excursion to a large grocery department will more directly fit into the previous experience of the children. Where do all of these articles of food come from? What are the large industries represented here?

(a) Fruit, in all of its preserved forms. (b) Great dairy products. (c) Grain in all forms.

Are any of these great industries in Chicago? By means of stereopticon views, pictures, and stories lead the children to see what these industries are and what they mean to us.

2. An excursion to South Water Street will follow. How do all of these food products reach Chicago? Where do they come from? It is only by means of the stereopticon and pictures that the children can be led to image the immense orange and lemon groves, the bananas, and other tropical fruits in their natural environment, the large vegetable gardens of California, and the people engaged in their culture. What can be the reason for the ripening of fruit and vegetables during our cold months? A visit to the conservatory will answer that question.

Notice: (a), the nature of the plants in the different rooms.

(b) The temperature at which each room is kept. What must be the appearance of the landscape where the temperature is continually that of the room containing the tropical plants?

3. An excursion to the Stock Yards. Where do all of these animals come from? Pictures and stories of the great stock-raising industries of the West. What is done with the immense amount of meat prepared for use? A visit to a refrigerator car, carefully examining its facilities for transporting everything in a fresh condition, will help to answer the question. What other industries grow out of the slaughter of so many animals?

Nature Study: Examinations of foods continued.

We shall try to obtain a picture of the month by means of records kept by the children. (a) The weather chart. (b) Sunshine chart. (c) A painting of the landscape each week. (d) And the charts summarizing these observations.

Prehension of food. Comparison of the present food of the park animals with that in their wild condition. How obtained under natural conditions? Relation of structure to function.

History: Story of Leonidas as a type of a Spartan boy and hero. The story of Leonidas at the Pass of Thermopylæ presents him as a hero. With the necessary description of the Persian Wars and the picturesque details of the battle at the Pass, the children will understand and appreciate the spirit that prompted the action.

How did he come to be such a man? This can only be answered by a detailed study of Spartan education.

1. Sparta itself and its environs.
2. Spartan house.
3. The gymnasia and Leonidas' exercises.
4. The race-course.
5. The market-place and what it meant.
6. Leonidas hunting on Taygetus.
7. His dress, military drill, and public eating-place.

Lead the children to see that the one purpose of Spartan education and life was to make hardy soldiers for the state.

As far as possible, the children will be led to enter into the life of the Spartan

boy, by playing his games, taking his exercises, making his house and dress, and painting scenes in his life.

The yearly games at the tomb of Leonidas will be described.

Literature: Robert Browning, *Story of Phidippides;* Mary Lamb, *The Spartan Boy;* Rudyard Kipling, *The Jungle Book;* La Fontaine, *Le Rat de Ville et le Rat de Champs.*

Number: Study of food values. Summaries of the weather charts, involving the use of whole numbers, fractions, and decimals. Planning and definitely ordering the amount of wood necessary in making the articles in the Manual Training Department.

Dramatic Art: Dramatic presentation of scenes in the life of Leonidas and Ulysses. Training in hearing and reproducing English vowel sounds continued. Poem to be studied and memorized.

Music: *Old Jack Frost,* Eleanor Smith's Songs, No. 2; *Ring Out, Wild Bells, Sea-Horses, The Brownies,* all in Modern Music Series, No. 2; *Winter Song,* Modern Music Series, No. 1; *Spinning Song,* Modern Music Series, No. 3; *Fair Snow White,* Fifty Songs for Children, Reinecke.

School Economics: Special point, care of lunch-room and desks.

Cooking: See Miss Cooke's Outline.

Textiles: The class will continue the work begun in December in the making of baskets, reeds being used for variety, instead of Indian splints. The baskets when finished will be for use in the textile room for the safe-keeping of sewing materials. The stories and pictures of Greek spinning and weaving will be better appreciated through actual experience with the wool fibers and the primitive processes of its spinning and weaving, for which reason the children will have lessons in spinning and as much as is possible for them to learn of the qualities in wool which make it easy or difficult to spin, e. g. fineness, strength, length, softness, and curl.

Fourth Grade History: (CLARA ISABEL MITCHELL.) The work outlined in History for December was set aside, and its place on the program given to hand-work, the making of Christmas presents, correlated with the History lessons of November. As the outgrowth of the children's interest in Indian life and art, they were allowed to design and make calendars of leather, ornamented with Indian patterns and pictures. Each child made a basket, also, of Indian splints, in the Indian style.

The History for January will follow the December plan, the work in weaving continuing, but in less frequent lessons.

The necessary written expression will take the form of a correspondence, which has been arranged by the geographical department of the school to take place between the Fourth Grade class and a school in Paris. In the letter written to Paris the children will tell of our own city and such part of its early history as they may agree upon as of sufficient interest to tell to children so far away.

The painting will illustrate the letters, giving pictures of the lake, the landscape coloring at different times of the year, the old Kinzie House, Fort Dearborn, and perhaps some interesting incident in the adventures of Joliet, Marquette, or LaSalle.

The work in textiles will be that suggested in December, the carding, spinning, dyeing, and weaving of wool into holders for the hot teakettle.

Geography for the Fourth Grade: Lake Michigan—what it means to Chicago.

I. The use of the lake. 1. Commerce. 2 Transportation. 3. Water. 4. Food.

II. How do the people protect these advantages?

1. Build lake-walls and breakwater piles. Why?

A visit to the shore will be necessary to enhance the images gained at the Dunes. There the children will observe:

1. The wearing and building of the waves.
2. The sand bars. Cause?
3. Discover the use of breakwater piles and piers.
4. Lighthouse. Its use. The children will

visit the lighthouse, and see how it is cared for. How are lighthouses built? Where are they built?

The story of the building of the lighthouse in *Caleb West* will be read to the children.

1. How do the Chicago people get their water from the lake? Why are the cribs placed so far out in the lake? The story of the first tunnel and crib will be told or read.

2. Why was the Drainage Canal built? Its value to Chicago.

Art: Illustrations of stories in History and Literature with clay, painting, blackboard, and charcoal. Painting of the landscape. Modeling in clay: animals in park.

Industrial Art: The children need a sewing-bag and all of its accessories, and will therefore make one.

French: The French will be entirely correlated with the Industrial Art, the Manual Training, and the Nature Study. All directions for work being given in French, the children will ask for assistance in the same language. The French literature for the month will be the dramatization of

Le Rat de Ville et le Rat des Champs.

Autrefois le rat de ville
  Invita le rat des champs
D'une façon fort civile,
  A des reliefs d'ortolans.

Sur un tapis de Turquie
  Le couvert se trouva mis,
Je laisse à penser la vie
  Que firent ces deux amis.

Le régal fut fort honnête,
  Rien ne manquoit au festin,
Mais quelqu'un troubla la fête,
  Pendant qu'ils étoient en train.

A la porte de la salle
  Ils entendirent du bruit,
Le rat de ville détale
  Son comarade le suit.

Le bruit cesse, on se retire;
  Rats en campagne aussitost
Et le citadin de dire,
  "Achevons tout notre rôt."

"C'est assez," dit le rustique;
  "Demain vous viendrez chez moi,
Ce n'est pas que je me pique
  De tous vos festins de roi;

"Mais rien ne vient m'interrompre,
  Je mange tout à loisir;
Adieu, donc, Fi, du plaisir
  Que le crainte peut corrompre!"

Fifth Grade

Willard Streeter Bass

History

The subject of the month's work will be the early history of New York. Special stress will be laid upon the study of the manners and customs, industrial conditions, and social and political institutions of the Dutch settlers. Comparisons will be drawn between the Dutch colony and the English colonies in New England and Virginia, and the pupil will be led to trace the source of their varying institutions back to fundamental differences in their character and occupations.

The geography of Holland will be studied by means of pictures and descriptions—e. g., *Hans Brinker*, Ch. II; and the long and unremitting struggle which the Dutch have waged against the ocean in order to secure and preserve their land will be made as vivid as possible.

The story of the Dutch struggle for independence will be related. The dramatic incident of the siege of Leyden will be told in detail, as it affords a striking example of the dogged courage and endurance of the Dutch, and a bold use of the peculiar geographic situation of their country. (See Motley, *Rise of the Dutch Republic*, Part IV, Ch. II.) The results of the long struggle upon the Dutch may be seen in the commercial activity and the religious tolerance which prevailed throughout Holland at the end of the sixteenth century.

The commercial activity of the Dutch, as well as their desire to sap the New World resources of Spain, led to the employment of Henry Hudson to search for a shorter trade route to the Spanish possessions. The story of his voyages will be told to the class, and the narratives of his discovery of the river which bears his name, and of the bay in which he met his tragic end, will be given with some detail. After the discovery of the Hudson River, the Dutch lost no time in establishing a trading station upon Manhattan Island. The class will study the geographical advantages of this situation (see geography outline for this month), to discover if there was any ground for the Dutch saying that the English had secured two shells in Massachusetts and Virginia, while they (the Dutch) had the oyster between them.

The Dutch West India Company was formed for the purpose of developing the trading station at New Amsterdam into a colony. Its methods were in striking contrast to those of the English, especially in its attempt to establish feudalism in the New World in the form of the "Patroon" system.

Life in the colony under the four Dutch governors will be studied from Irving's *Sketch Book* and *Knickerbocker History*. The pupils will compare the manners and customs, character and motives of the people, and their architecture and household utensils with those of the English colonists. The struggle of the people for a voice in the government will be watched, and their small success will be compared with the great achievements of the English in Massachusetts and Virginia.

The teacher will tell the story of the giving of New Amsterdam to the Duke of York by Charles II., and how the Duke made good his title by capturing the city from the Dutch. The class will form an opinion as to whether the English or Dutch had the better claim to the valley of the Hudson, why the Dutch settlers were willing to accept English rule, and whether the English had governed their colonies of Massachusetts and Virginia so much better than the Dutch that they deserved to have New Amsterdam also.

Dramatic Reading: Irving's *Rip Van Winkle* will be carefully studied and read by the class.

Written Work: Story of Henry Hudson's voyages.

Industrial Art: The weaving with a hand loom which was begun in December will be continued.

Sloyd: The construction of the colonial loom planned for earlier in the year will be begun this month. The class will examine colonial looms and pictures of them. Each pupil will be assigned the construction of a certain part of the loom, and will make a working drawing of his part before he begins work upon it.

References: Motley, *Rise of the Dutch Republic;* Old South Leaflets, No. 94, *The Discovery of the Hudson River;* Winsor, *Narrative and Critical History of America*, Vol. IV. pp. 395. Fiske, *The Dutch and Quaker Colonies in America*, Vol. I. Irving, *Knickerbocker History of New York.*

FOR CHILDREN.

Mary Mapes Dodge, *Hans Brinker;* Irving, *Rip Van Winkle, Legend of Sleepy Hollow.*

Geography

The subject for the month will be a study of the Atlantic coastal plain and its river systems. On account of its historical and commercial importance, special attention will be given to the study of the valley of the Hudson.

The general location of the Appalachian Mountains and the Atlantic coastal plain will be shown upon a sand-modeled map of North America. A sand-modeled map will then be made representing these mountains and coastal plain upon a larger scale, and showing the river-basins and regions whose history has been studied this year.

The action of rivers will be studied in the laboratory. The action of running water upon earth will be made to show (1) how the river cuts back at its source, leaving the harder portions of the soil as mountains; (2) how the river, where the current is swift, carries away earthy material, making its bed deeper and wider; (3) how the river, where the current is slow, may deposit material, making its bed shallower; (4) how the river deposits material at its mouth, forming a delta or an alluvial fan.

Pictures of characteristic landscapes in the Appalachian Mountains will be shown, and the effects of erosion there will be studied and compared with those observed in the laboratory. Pictures of the Piedmont region will then be shown, and the valleys compared with those formed in the laboratory.

The effect of the rise or fall of the land at the mouth of a river will next be studied in the laboratory. After a river has been at work for some time, the level of the water into which it discharges will be lowered. The deposit which will have formed under the water will be observed, and the pupils will try to deduce what would be the general appearance of a coast which had recently risen from the ocean. These deductions will be compared with the present appearance of the south Atlantic coast. The experiment will then be performed of drowning a river valley by raising the level of the water into which it discharges. The results will be compared to the present appearance of the Connecticut, Hudson, Delaware, Susquehanna, and other northern rivers.

The class will then undertake a special study of the Hudson to determine, if possible, the causes which have made New York the most important American seaport. They will at once see the great advantage which its fine harbor gives to the city. By consulting relief maps they will see that the Hudson, with its tributary the Mohawk, gives the most direct and easiest route to the Great Lakes and the West, and that in connection with Lake Champlain it also furnishes an easy route to Canada. Let the children try to draw conclusions from these premises regarding the commercial and military importance which must of necessity accrue to the city which the Dutch founded at the mouth of this river.

Written Work: Reports on experiments in laboratory. Reasons for commercial importance of New York.

Modeling in Sand and Chalk: Maps of North America, Atlantic Coastal Plain, and Hudson River Valley.

References: Tarr and McMurray, *North America;* Frye's, Rand and McNally's, Werner's, and Natural *Geographies;* Carpenter's Geographical Reader, *North America*, pp. 57+.

Nature Study

METEOROLOGY: The weather record, by means of the color chart and graphical thermometer and barometer records, will be continued through this month.

ASTRONOMY: The sun's slant will be observed with the skiameter as in December. The pupils will probably observe that while the sun is higher than in December, the average temperature of the

month is lower. They will endeavor to find the reason for this themselves, and should be able to see that the heat stored up from last summer made December a warmer month than it otherwise would have been, and that January is to a much less degree benefited by this stored-up heat supply.

FOODS: A study of the ordinary cereal foods will be undertaken during this month. The points studied will be (1) the plants, and the part which is used for food, (2) the geographical distribution of the crops, (3) the preservation of the crop and its transportation to market, (4) the preparation of the food for the table.

Specimens of wheat, barley, oats, rye, corn, and rice as they grow upon the stalk will be shown the class. The pupils will carefully examine and compare them, and in order to clearly observe their peculiarities, will paint them. The pupils will then find out what they can about cultivation of these crops and their preparation for the market. (See reading outline below.)

The class will find from United States crop bulletins the number of bushels of each of the above grains produced in each state. A chalk-modeled map of North America will then be made, and the areas which produce the different grains will be marked with appropriately colored chalk.

The transportation of the grain from farm to market will then be considered. The crop map just described will show the routes over which the grain must be transported, and will give the pupil data from which to reason whether the transportation will be by railroad, steamer, or canal-boat. The importance of Chicago as a center of grain distribution will be considered, and the class will visit one of the large elevators and see the methods by which the grain is stored and reshipped.

The preparation of the different corn products for the table will form the basis of the work in cooking for January. Such comparison with the other cereals will be made as is suggested by the questions of the children, or as is necessary for illustration of the properties of the corn. The effect of heat on corn will be shown by popping and parching. The northern and southern use of corn will be illustrated by corn meal and hominy, and an early method of preparation will be shown in hulled corn.

Number Work: Problems like those described in the November COURSE OF STUDY will also arise from this month's weather record, and will furnish further drill in the use of fractions.

The work upon foods and the geographical distribution of crops will give rise to problems like the following:

From the number of acres of wheat, corn, rye, etc., and the number of bushels of each grain produced in a State, find the number of bushels produced per acre, and thus determine in which State the soil and climate are best adapted for the raising of each grain.

From the quantity of grain which can be grown upon an acre of land and the price of grain per bushel, determine which grain yields the greatest value per acre.

Let the pupils estimate in the laboratory the quantity of each cereal which, if used alone, would be necessary for a meal. From the price paid for the food have them determine the value of these (approximately) equal quantities of nourishment. See if there is any relation between the value of the equal quantities of nourishment and the value of each kind of grain which grows upon an acre.

Find the part, expressed as a common fraction and as a per cent, of the whole United States crop of wheat, oats, corn, etc., which is grown in Illinois.

Reading: Descriptions of the cultivation of the various grains, such as are found in Carpenter's Geographical Reader, *North America*, pp. 120-123, 159-170. Longfellow, *Song of Hiawatha*, XIII.

Written Work: Record of experiments and work in cooking.

Painting: January landscape. Stalks of the

various cereals will be painted to show the structure of the plants and particularly their points of similarity and difference.

References: Jackman, *Nature Study and Related Subjects*, pp. 90-91; Chisholm, *Handbook of Commercial Geography;* U. S. Agricultural Department, *Crop Bulletins, Album of Agricultural Graphics;* Division of Chemistry, Bulletin No. 50, *Composition of Maize;* F. L. Sargent, *Corn Plants.*

Music: The Fifth Grade will be united with the Sixth for instruction in music. For outline of the month's work, see Sixth Grade.

Physical Training: The Fifth Grade will be united with the other grammar grades for gymnastics. For outline of work, see Physical Training.

German:

Vergißmeinnicht.

Ein Blümchen ſteht am Strom
Blau wie des Himmels Dom;
Und jede Welle küßt es,
Und jede auch vergißt es.

Wilhelm Arent.

Der weiße Hirſch.

Es gingen drei Jäger wohl auf die Birſch,
Sie wollten erjagen den weißen Hirſch.

Sie legten ſich unter den Tannenbaum:
Da hatten die drei einen ſeltſamen Traum.

Der erſte.

„Mir hat geträumt, ich klopf' auf den Buſch,
Da rauſchte der Hirſch heraus, huſch, huſch!"

Der zweite.

„Und als er ſprang mit der Hunde Geklaff,
Da brannt' ich ihn auf das Fell, piff, paff!"

Der dritte.

„Und als ich den Hirſch an der Erde ſah,
Da ſtieß ich luſtig ins Horn, trara!"

So lagen ſie da und ſprachen, die drei,
Da rannte der weiße Hirſch vorbei.

Und eh' die drei Jäger ihn recht geſeh'n,
Da war er davon über Tiefen und Höh'n.
Huſch, huſch! piff, paff! trara!

Ludwig Uhland.

Sixth Grade

Edith Foster Flint

History

The subject for the month is Marco Polo's city, Venice.

I. Situation of Venice: Marshy island; untillable and salt-encrusted soil; no mineral wealth; no timber; but well placed at the head of the Adriatic.

II. Effects of this physical environment: (1) On history: (a) Island first used as refuge from the mainland at times of barbarian invasion; (b) city naturally became a maritime power, and looked toward the East: (c) city aided the Crusaders with its fleets, and reaped commercial advantages in return; (d) became a refuge for scholars and manuscripts from Greece; freedom of thought in Venice; valuable work of Venetians in preserving, editing, and translating the classics.

(2) On industries: (a) The salt trade a Venetian monopoly; (b) Commerce: Doges cleared the sea of pirates, and became "protectors of the sea." (The ceremony of wedding the Adriatic.) Trade with the East; from the Arabs the Venetians learned the manufacture of gunpowder and of glass, and from the Persians the weaving of tissues. (c) The Venetian fleet. (d) The arsenal.

(3) On building: (a) First houses of Venice were wooden huts; then as the people grew rich they were compelled to build strong stone houses for defense against the pirates; (b) influence of the East on Venetian architecture: the Venetians "made Oriental architecture their own, impressing on it the stamp of their special needs and national genius." Venetian architecture a blending of Byzantine, Moslem, Gothic, and Florentine. (c) The problems presented by the canals; canals have been deepened or filled, marshes drained, and piles driven. Two methods of building, with piles and without.

III. Famous examples of Venetian architecture: St. Mark's, Ducal Palace, Campanile. (Here pictures will be used, and the Venetian style compared with others which the children have studied and are familiar with; e. g. the Chinese, the Indian.)

IV. Venetian painting: full of color and richness. Why? How did there come to be a Venetian *school* of painting? The guilds; apprenticeship. Bellini, Lorenzo Lotto, Palma Vecchio, Giorgione, Titian, Tintoretto, Paul Veronese. (The children will see many photographs of works by these masters, and will learn from them what the spirit and interests of Venetians at that time were.)

V. The government under which all this was accomplished: An aristocratic republic; the doges at first elected by popular assembly, but later only the popular form was kept, while the spirit was purely aristocratic; the great council; the lesser council.

VI. The decline of Venetian power; the geographical discoveries of the Portuguese and Spanish a great blow.

References: F. R. Stockton, *In Florence and Venice.* (See *Personally Conducted*, p. 100-18). Same, *St. Nicholas*, v. 13, p. 349-57, 1886; J. A. Symonds, *Venetian Medley.* (See *Sketches and Studies in Italy and Greece*, v. 1, p. 254-314); H. Taine, *Venice.* (See *Italy: Florence and Venice*, p. 217-271); *Venice.* (See *The World: Its Cities and Peoples*, v. 1, p. 124-53.) *Encyclopedia Britannica.*

Geography

The subject for the month is ITALY. The children will study the country first in its relation to the rest of Europe, noting how it is cut off by the Alps, the Mediterranean, and the Adriatic. They will determine its length and average breadth from the scale on the map, compute its area, and compare with that of Illinois, of the United States, of India and of China. They will also compare its importance, past and present, with that of China, and inquire into those of its causes which are geographical. The shape of the peninsula, too, they will compare with that of the peninsula studied last month—India. Italy, as a whole, will be modeled in sand and in chalk, as well as the great natural divisions—northern Italy, the basin of the Po, and central and southern Italy. The courses of the Po, the Adige, the Arno, and the Tiber will be studied, and something learned of the famous cities along their banks. The children will also consider the—

1. Climate: (a) In the north, cold winter (10°), because of cold winds from Alps and interception of warm, damp winds from Mediterranean by Ligurian Alps. Mean winter temperature of Turin lower than that of Copenhagen. (b) In the south sugar-cane, dates, cotton, cactus, and aloes grow. (c) In the Abruzzi inhabitants often snow-bound for weeks.

2. Productions: wine, olive oil, wheat, oranges, lemons, citron, pomegranates, rice. Mulberry extensively grown and much silk produced.

3. The lakes: (a) At the foot of the Alps; their beauty; their great depth. Compare in size with Lake Michigan. (b) In central Italy, volcanic in origin, occupying the craters.

4. The volcanoes: Vesuvius as a type; volcanic action.

References: M. M. Ballou, *Italy* (see *Footprints of Travel*, p. 177-211); Robert Brown, *The Italians* (see *Peoples of the World*, v. 5, p. 234-320); Nathaniel Hawthorne, *Italy* (see passages from the *French* and *Italian Note-books*, p. 50-506); Stanton Page, *The Chevalier of Pensieri-Vani;* Reclus, *Italy* (see *Earth and Its Inhabitants; Europe*, v. 1, p. 183-362); J. A. Symonds, *Italy* (see *Sketches and Studies in Italy and Greece*, v. 1, p. 83-344, v. 2 and v. 3, p. 1-338); H. Taine, *Italy: Rome and Naples;* H. Taine, *Italy: Florence and Venice.*

Science

The subject for the month is food, and the work of the class will be confined to the study of the food products of Italy—especially of those seeds which are used as food. In this way the work will supplement the October study of seed-distribution, will correlate with the history and geography subjects, and will be specific

enough to come within the range of the children and appeal to their interest. They will first consider the common seed foods of Italy—beans, lentils, wheat, rice, and millet. Through these they will come to an inquiry into the nature and uses of starch. This starch they will obtain from wheat by putting flour into cheese-cloth and washing it. With the starch thus derived, starch-paste will be made and the iodine test applied. Then other seeds will be tested for starch. After this, starch grains from different sources will be shown under the microscope, and the effect of different degrees of heat on starch will be exhibited, with starch and cold water; starch and water at 140° F.; and starch boiled. For each temperature an examination under the microscope will be made. (The children will, of course, perform these experiments themselves in the laboratory.) Finally, the use of starch in the body will be studied, and its heat-producing nature illustrated by experiment.

The cooking for the month will be correlated throughout, and will embrace the preparation of beans, lentils, macaroni, and rice.

References: U. S. Experiment Station Bulletins, *Dietary Studies* by W. O. Atwater and others; Randolph Faries, *Practical Training for Athletics, Health, and Pleasure;* Robert Farquharson, *School Hygiene and Diseases Incidental to School Life*, 1885, p. 37-73); M. Foster, *Text-Book of Physiology;* M. Foster and L. E. Shore, *Physiology for Beginners;* William Howell, ed., *American Text-Book of Physiology;* J. E. Pilcher, *First Aid in Illness and Injury;* E. H. Richards, *Cost of Living as Modified by Sanitary Science;* E. B. Uffelman, *Manual of Domestic Hygiene of the Child;* D. Waller, *Introduction to Human Physiology;* W. M. Williams, *Chemistry of Cookery.*

Textiles: Dyeing of cotton roving (yarns) for use of First Grade children in weaving. Cotton dyes used will be those given to the school by William Matheson and Company of New York.

Music: The singing of rote-songs related in subject to the world about them and to certain topics in particular will be continued by the children of this grade. Indirect drill upon simple and beautiful tone-production will be emphasized this month more than heretofore. For example, with the work on clear enunciation which is necessary to make themselves intelligible to other people comes drill upon pure vowel quality and exact, smooth consonants, both of which are fundamentally necessary to good tone-production. Breathing exercises will be an important part of the work this month. The need of a quick, full breath in singing their rapid rote-songs is quite apparent to the children. Exercise: (1) Take quick, full breath through the slightly open lips (without lifting shoulders), filling out the line just above the waist. (2) Exhale suddenly, from the waist line. After some control of the diaphragm is attained, begin inhaling and exhaling as slowly as possible, never exhausting the lungs, and keeping a full, active chest to the end.

Sea-Horses, one of the songs for the month, has a poetic text, and the music gives the wild onward rush of waves, and the roar of the breakers as they strike the shore. It will perhaps add to the spirit of the geography work. *The Way to School* will be used for sight-reading and dictation.

Songs: *Sea-Horses; The Voyagers; Ring Out, Wild Bells; The Way to School* (all in Modern Music Series, Second Book); *Winter Song; Three Part Round* (Modern Music Series, First Book); *Spinning Song; Welcome, Wild Northeaster* (Modern Music Series, Second Book).

Number Work: Aside from the number work growing out of the subjects for the month, the children will begin to keep personal school accounts, and through this means commence the study of banking.

French: One of La Fontaine's fables will be dramatized.

Reading: Selections from *The Merchant of Venice;* Ruskin on *St. Marks; Giovanni and The Other*, by Mrs. Burnett.

Seventh Grade

Katharine M. Stilwell

History and Geography: The history and geography are so closely united in the plan of work for this grade that for the present it seems best to present the work in one outline. The pupils have already a general idea of the structure of Eurasia. This will be followed by a close study of the short slope. The details will be discussed as the scene of history shifts from country to country.

The history outline for November contained more work than could be done in the time allotted. So the subjects planned for December will be continued through the month of January.

The class has followed the Romans in their struggles for social and political adjustment; they have seen how Rome, in repelling the Gauls, preserved the Italian civilization and solved the problem of the unity of Italy.

Through this study of history they have gained some knowledge of the geography of Italy. The following points have been discussed:

1. Location.
2. Size: Extreme length; extreme width; area; area to-day; coast-line.
3. Surface: Mountains: Alps; Apennines; character and appearance of each; direction; average height; peaks, etc. Plains: location and appearance; character of coasts; harbors.
4. Drainage: Po, Arno, Tiber.
5. Climate: Temperature and rainfall as affected by the mountains; prevailing winds.
6. Occupations and productions.
7. Influence of Italian geography upon history: (a) Elements of historical significance; Apennines; slopes; Po valley. (b) Nature of influence: Difficult to defend country because of long slope; easily conquered by Rome; outlook toward west; contrast with Greece; lack of harbors; relation of mountain to plain.
8. Rome's geography and its influence: The river Tiber; the series of hills; character of the land about Rome.

The expression has been sand and chalk modeling, scenes illustrated in black and white and in color and clay modeling of Roman citizens, Gallic soldiers, etc.

As the pupils continue the history (see November and December outlines), the geography necessary to the work will be taken up in topics similar to the following outlines: *Sicily.* (First Punic war).

1. Shape, triangular.
2. Size, 9,935 square miles.
3. Surface: Limestone ridges, steep in the north, sloping toward the south; higher range in northeast of granite; Mount Ætna; volcanic; 10,800 feet high; fertile plain south of Ætna.
4. Drainage: River Symæthos; character of other streams.
5. Climate: Rain in winter, dry summers.
6. Productions: Wheat.

Spain. (Second Punic war.)

1. Location, latitude, longitude.
2. Size: Area at time of war; area to-day (190,000 square miles); extreme length, 650 miles; coast-line, 1,300 miles.
3. Surface: Lofty tablelands (1,000 to 3,000 feet); rugged and ill-watered; mountains run from east to west; Pyrenees on the north, Cantabrian in the northwest, Guadarrama in central part, Sierras Morena and Nevada in the south; deep valleys between the mountains.
4. Climate: (a) Zone of plateau, arid soil; cold in winter; hot in summer. (b) Northwest province, moist. (c) East coast, preserves the balance. (d) Sub-tropical zone of south coast hot and humid. Trace Hannibal's route through Northern Spain, across the Pyrenees, along the Rhone, across the Rhone, over the pass in the Alps to Italy.

FRANCE: (Cæsar.) 1. Location: Boundaries to-day; compare with Gaul.

2. Size to-day: Area, 205,986 square miles; coast-line, 1,600 miles.

3. Surface: Character of coasts; mountains, Pyrenees, Alps, Jura; character and peaks; height; plateaus, southeastern worn down by rivers; Cevennes Mountains, Auvergne; northeastern tableland. Plains—plain of the Rhone; the western plain, Garonne, Loire, Seine.

4. Climate; Rainfall, temperature, prevailing winds, mistral.

SWITZERLAND: (Cæsar.) 1. Location; latitude, 45°-47°; longitude, 6°-10°.

2. Size: Area, 115,992 square miles; length, 210 miles; width, 130 miles.

3. Surface: (a) Alps; Bernese, Oberland, Pennine, Lepontine, Rhœtian Alps. Appearance, peaks and passes. (b) Jura; parallel chains; limestone. (c) Tableland; average height, 1,380 feet.

4. Drainage: Rivers, lakes.

5. Climate.

6. Occupations: Agriculture, manufacturing.

THE DANUBE BASIN (conquest of the East). Austria-Hungary: 1. Location: 241,000 square miles in area.

2. Surface: Three-fourths of surface mountainous. Eastern Alps between Switzerland and the Danube. Plains of Hungary surrounded by Carpathian Mountains. Length, 880 miles; area, 22,500. Geological history of plain.

3. Drainage: Description of the Danube. The Iron Gate and its effect.

4. Climate: Temperature—why? Rainfall.

5. Occupations: Nine-tenths of surface productive. Agriculture, manufacturing.

THE BALKAN PENINSULA: 1. Location.

2. Surface; Balkan Mountains, tablelands.

3. Drainage: Danube and its tributaries.

4. Climate as affected by latitude and elevation.

5. Divisions: Formerly Illyricum and Macedonia. At present Bulgaria, Servia, Turkey-Greece, and the Roumanian plain.

The class will obtain an image of these countries through lantern-slides and the pictures in the school collection. This image will be expanded by vivid oral descriptions, by reading, and by the correspondence plan in last month's outline. Conditions will be presented enabling the pupils, as far as possible, to reason out the resulting climate, productions, and occupations of the people. Our weather conditions here will be contrasted with those of the country under discussion and landscapes of the countries will be compared.

Writing, drawing, and painting will constantly be used as modes of expression. Maps will be modeled in sand and chalk. Longman's atlas will be used for reference.

References: Ballou, *Footprints of Travel;* Boner, *Transylvania, Its Products and Its Peoples;* Brown, *Peoples of the World;* Reclus, *Earth and Its Inhabitants;* Dunlop and Dunlop, *How We Spent the Autumn;* Hawthorne, *Passages from the French and Italian Notebooks*, p. 9–50, 506–28; Holmes, *Our Hundred Days in Europe;* Reclus, *Earth and Its Inhabitants;* De Colange, *Voyages and Travels;* Jebb, *Modern Greece;* Mahaffy, *Rambles and Studies in Greece;* Symonds, *Sketches and Studies in Greece and Italy;* Tozer, *Islands of the Ægean;* Page, *The Chevalier of Pensieri-Vani;* Taine, *Italy;* Whymper, *Scrambles Among the Alps; The World, Its Cities and Peoples;* Dennis, *Summer in Andalusia.*

Nature Study: The class will continue the work on a plan for lighting, heating, and ventilating our new school building. For details of this work, see December outline.

Number Work: Number will be used in the Nature Study as indicated in the outline. It will be used when necessary in the geography work. Problems will arise on each country similar to the following on Spain.

1. Compare the area of Spain (190,000 square miles) with the area of Italy (92,000 square miles).

2. The plain area is what part of the whole area of Spain? Compare with Italy (2,700 square miles of plains).

3. How many States the size of Illinois (56,650 square miles) can be made out of Spain?

4. What per cent of Spanish soil (Gibraltar, 1,240 acres) belongs to the English?

5. In old Iberia there are still 27,000 square miles of wooded land, only 11,600 of which are genuine forests. What part are thickets? What per cent?

6. Compare the coast-line of Spain (1,300 miles) with that of Italy. Compare the average elevation of Spain (2,300 feet) with the average elevation of Italy. Compare their highest peaks; their longest rivers.

7. What is the effect of coast-line? How many miles of coast-line to one square mile of area? Compare with Italy.

8. What per cent of the coast-line of Spain is on the Mediterranean (714 miles)? On the ocean?

9. What is the average population (17,329,-

032) to the square mile? Is this a dense population? Account for this.

10. Construct a square, the sides of which are each 5 units (inches) long, and rule it into small squares, the number of which equals the average population on twenty-five square miles in Spain, in Italy, in the United States, in the world. A population above the average in density would be called a dense population, below the average would be a sparse population. What country has the average population? What countries are densely populated? What ones are sparsely populated?

11. The length of the Ebro is equal to fifteen times the distance of its source from the ocean. Why is this?

12. Compare the Ebro with the Po in length.

13. Compare the basin of the Ebro (3,800 square miles) with the basin of the Po (29,000 square miles).

14. The average discharge of the Ebro is 3,500 cubic feet per second, while the Po discharges on an average 60,734 cubic feet per second. How do you account for this?

15. Compare the average temperature of Spain with the average temperature of Chicago for the last twenty-five years (consult U. S. Weather Bulletin).

16. Compute the yearly rainfall at Chicago. Compare this with Spain.

The work in Manual Training will require the use of geometry.

Algebra will be taken up this month. It will be taught in the closest connection with mensuration, and in accordance with the plan suggested by Mr. G. W. Myers in the December COURSE OF STUDY. Additional problems will also be found in the Eighth Grade outline in this issue.

Oral Reading: The study of Julius Cæsar will be continued.

Manual Training: In correlation with the month's work in Nature Study, the pupils will construct the model of a house. This will involve a study of the materials to be used. Tests will be applied to determine the fitness of the various woods for the necessary parts of the house. The pupils will discuss different methods of construction.

Music: The work for the Seventh and Eighth Grades will be much the same as for the Fifth and Sixth, there being slight difference in the groups in respect to ability to sing the rote-songs, and in the technical exercises required. Work in sight-reading will be done by these grades, and a large number of the simple songs in the first part of the "Primer," Modern Music Series, will be used for this purpose.

Songs: *Ring Out, Wild Bells*, Modern Music Series, Second Book; *Winter Song, Three Part Round* (p. 104), *Three Part Round* (p. 111), Modern Music Series, First Book; *Welcome, Wild Northeaster, In the Tempest, Winter and Spring, A Snowy Day*, Modern Music Series, Third Book; *On the Wild Rose-Tree*, Songs of Life and Nature.

Cooking: The next quarter will be spent, at the suggestion of the children, in learning to prepare and serve an Easter dinner, for their teachers. The pleasure that it will give the teachers will be used to arouse a desire in the children for a knowledge of the foods and food materials used. The children will be asked to bring in menus for the dinner, and these will be discussed in the class, with special reference to food values and cost.

Industrial Art: Textiles. The Seventh Grade will weave small rugs or mats on the school loom. They will begin the making of textile design on the squared paper, and the building of the chain.

Eighth Grade

Nott William Flint

Nature Study: I. VENTILATION AND HEATING (continued): The class will now see that a house, like the people who dwell in it, must be made to breathe, else it will prove unfriendly to human life. Also, that ventilation in most of our houses is a matter of chance, due to an ill-fitting door or window—the mistake of a carpenter.

The actual problem for ventilation which any given building presents may now be taken up, together with a study of the methods of heating.

II. An examination of the ventilating conditions in any given place will embody the following inquiries: (a) Cubic space in given room or building. (b) Size and position of outlets and inlets. (c) Distribution of air over room from inlets. (d) Amount of fresh air supplied per person per hour. (e) Examination of motive forces used to induce air movements.

NOTE.—(a) In getting cubic space of rooms the student should make corrections for all inequalities of walls, all projections into room, and all solid articles. For instance, 10 cubic feet should be allowed for a bedstead and bedding; for an adult person 3 cubic feet. (b) Size of inlets and outlets: Ventilating area of perforated bricks, or of gratings, can be found by measuring actual superficial area, and calculating relative size of interstices. In inlets, accumulations of dust should be noted; in outlets, any impediment to a free passage. In open fire-places find area of smoke flue (flue should have 16 square inches for every square foot of grate). If doors and windows are the only means of ventilating a room, what is their best adjustment? For the examination of a system of artificial ventilation, the architect's plans should be seen, if possible. (c) Direction of air currents in room may be determined easily by one of the following methods: Smoke from bit of smoldering cotton; floating fibers of floss silk, or bits of feather; candle flame (good only where current is strong). (N.B., get children to think up ways of determining currents.) Direction of air at different times and under different weather conditions. Doors and windows, if not part of the system of ventilation, should be closed during examination.

ANEMOMETER: If this instrument can be had, the exact volume and velocity of direct air currents may be determined. Note: Set anemometer well inside opening to be measured, and take time unit with watch; then multiply the resulting linear velocity by sectional area of opening.

III. The children should now work out the principles underlying the two systems of ventilation, and discuss the advantages of each.

1. Plenum: (a) Air is forced into room and building. (b) Does not suck foul air from sewers and basements. (c) Not disturbed by wind.

2. Exhaust: (a) By means of mechanical fans. (b) By heated flue or flues.

IV. Heating of houses: Each student will make a full report on the heating apparatus in his own house. (a) The open fire. (b) The close stove. (c) Hot water and steam.

Field Trip: The class will visit the Newberry Library with the special object of seeing a system of ventilation at work.

Manual Training: Some members of the class will make a model house with a glass side for the purpose of studying the principles of ventilation. N. B., A chalk box with a glass slide will do for this experiment. Cut a hole in one end and at the top. Through the hole at the top fit a common argand chimney; beneath this place a bit of candle. If a piece of smoking rag be held at the end opening, through the glass side of the box, ventilation can be seen going on.

History and Geography: (See Miss Stilwell's Seventh Grade outline.)

Mathematics: The work in Nature Study for this month is full of suggestions for number work. The computation of areas and of cubic spaces of rooms and buildings, together with the many corrections to be made for irregularities of wall and for projections into room, will give much practice in number work. In January, also, the grade will begin the study of algebra, using Professor Myer's algebra for Seventh and Eighth Grades, published in the December COURSE OF STUDY, as well as the following problems, also his:

Algebra for the Seventh and Eighth Grades: (GEORGE W. MYERS.) Algebra should not be taught as a separate subject in the grammar grades. In the writer's opinion it may, however, be studied with the greatest profit from the fifth grade upward, *if it is kept in closest connection with the work in arithmetical number*. The grade work in algebra should aim to teach:

1. The meaning of the representation of

magnitude by letters, including much of the notation and symbolism.

2. The use of the method of *mathematical induction*.

3. The significance and advantage of the equation as a concise expression of the general truths of number.

4. The first steps in the translation of symbolic statements into verbal statements and *vice versa*.

The first of these aims is best reached through the representation by letters of the lines, areas, and volumes which occur in mensuration. The second and third are secured by generalizing from a number of well-understood, concrete arithmetical problems to their algebraic analogue. The fourth is well attained by requiring the symbolized statement of the general truth before the rule is taught, the rule always being reached simply by expanding the formula into words. The following exercises are a continuation of what was begun in the December COURSE OF STUDY under the caption *Pedagogic School*. As a rule, each algebraic problem is preceded by a *single* simple arithmetical exercise, which is to be regarded as typical of such as will be readily supplied at the teacher's discretion as a basis for the algebraic generalization. Teachers are requested to try these exercises in the Fifth and Sixth grades and report results to G. W. Myers of the Chicago Institute.

45. Cut from paper a right triangle having two of its sides 1 inch long. Call one of the small angles x. Fold the paper about a line through the vertex of the right angle and the middle point of the long side. What other angle of the triangle may be called x? Referring to Example 40, can you write an equation from which you can find the value of x in degrees?

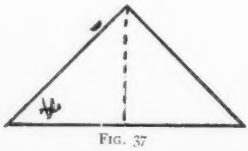


FIG. 37

46. If the short side of the triangle of Example 45 be called x and the long side y, write an equation for the perimeter and another for the area and find the values of x and y from these equations.

NOTE.—For the surface unit use the square of the linear unit in terms of which you express the sides.

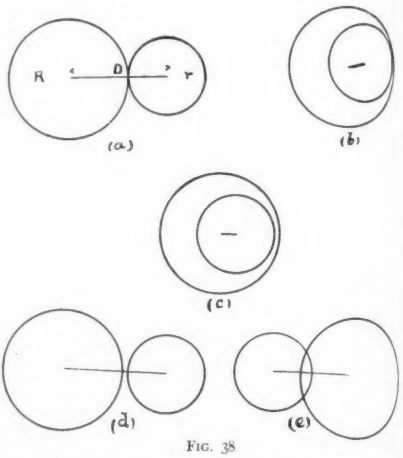


FIG. 38

47. Denote the distance between the centres of two circles by D, the radius of the larger circle by R, and of the smaller by r. Write as an equation the relation between these quantities (a) for external tangency; (b) for internal tangency; (c) for one circle wholly within the other; (d) for one wholly without the other, and (e) for the intersection (cutting) of the circles.

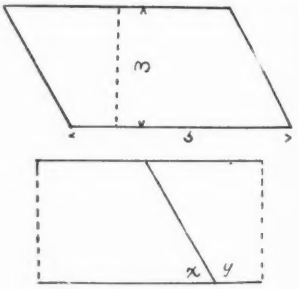


FIG. 39

48. Draw a parallelogram, and cutting it square across, turn the pieces about and fit them together as in the figure. Taking length and depth as indicated, what is the area?

49. Denoting one of the small angles of the parallelogram by x and a large one by y, by

fitting the ends over each other can you tell the sum of all the angles of the parallelogram?

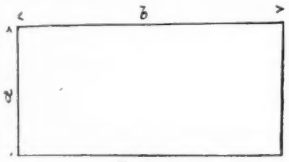


FIG. 40

50. If a carpet is 2½ feet wide, how many yards will be needed to cover the floor of a room a yards long by b yards wide? How many if the carpet is c feet wide?

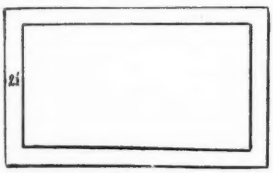


FIG. 41

51. A room is a feet long and b feet wide. How many square yards are there in a rug that covers the middle of the floor, leaving a 2½-foot strip uncovered all round the room? How many square yards if the strip is c yards wide?

52. What part of the oblong of Fig. 16 is: (a) A horizontal row of small squares? (b) A vertical row? (c) What part of the oblong is one small square? (d) How many small squares in a horizontal row? (e) In what other way, then, may you answer a? And b? (f) What part of the oblong is a horizontal row plus a vertical row?

NOTE.—Indicate your steps thus:

$$\tfrac{1}{3}+\tfrac{1}{7}=\tfrac{7}{21}+\tfrac{3}{21}=\frac{7+3}{7\times 3}.$$

NOTE.—Supply a number of exercises like this, using arithmetical numbers.

53. Answer the same questions for the adjoining figure as are asked in the last exercise, indicating your steps as there directed. Make a rule which applies to the addition of any two fractions having 1 for numerators.

54. (a) What part of the oblong is two vertical rows of squares? (b) Two horizontal rows? (c) What part of the oblong is the sum of two vertical and two horizontal rows?

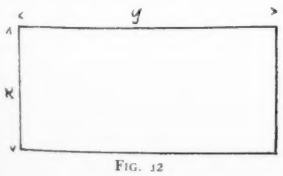


FIG. 42

NOTE.—Indicate your work thus: $\frac{2}{10}+\frac{2}{9}=2(\frac{1}{5}+\frac{1}{10})$. Give other exercises like this.

55. Answer the same questions for the adjoining figure as are asked in Exercise 54, and from your answers make a rule by which you may add quickly any two fractions having 2 for numerators.

56. Of the days of July 18% were cloudy. How many days were cloudy? How many were clear?

57. R per cent of the days of April were cloudy. How many days were clear?

58. Six per cent of b days were clear. How many days were cloudy?

59. R per cent of a days were clear. How many days were clear?

60. If b denote the base, r the rate per cent, and p the percentage, what law (equation) can you write connecting these numbers?

61. If P denote the principal, or the interest, on $1 for one year, and I the interest on the whole principal for the time, t, in years, what relation (equation) connects these numbers?

REMARK.—In every case precede the literal problem with analogous problems in arithmetical numbers.

Textiles and Fabrics: The seventh and eighth grades will weave small rugs or maps on the school loom. They will begin the making of textile designs on squared paper, and the building of the chain.

Latin: The class has been able to do more work than was planned in the December outline for the eighth grade. They will continue the reading lessons prepared for the Ninth Grade (pp. 327-329, December COURSE OF STUDY). In addition they will use the lessons printed on pages 475–481 of this number.

Music: (See Seventh Grade outline.)

Physical Training: Class practice: Series of free exercises—standing, marching, hopping, running, use of hand apparatus, elementary apparatus gymnastics, use of adjustable, horizontal, vertical, and hanging parallel bars and vaulting apparatus. Individual practice: Standing and running, broad and high jumping, rope-climbing with foot-grasp; comparison with December records at end of month. Games (indoors): basket-ball; (out-doors): hare and hounds.

The High School

Ninth and Tenth Grades

Latin: (ALLEN W. GOULD.) The pupils began with the study of the Roman school, because that topic seemed to connect itself most naturally with their own school life, and so would help to make the subject real to them. Their own experience would enable them to assimilate the Roman schools and studies. Pictures of Roman books and writing material were used to give distinctness to their ideas, and photographs of the streets and colonnades of Pompeii shown to give a local habitation to the Roman children as they came and went with their slave attendants.

The clothing followed next as a necessary detail to make the picture more complete in the mind of the child, and the evolution of clothing with the kinship of Roman toga and Indian blanket, served to give more unity to the growing idea. Pictures of statuary and vase-paintings helped to show how the garments were shaped and folded and fastened. We were fortunate this year in having at our Thanksgiving Festival a procession in costume which admirably illustrated the Roman robes, and intensified the interest of the pupils.

As each topic becomes clear to the child, he is encouraged to express it in Latin by using the idea rather than the mere words, and so the Latin sentences are to be made as answers to questions rather than as a translation of so much English into Latin.

Immediately following the study of schools and clothing come two lessons (VII and VIII), printed by mistake in the December issue. They both contain stories of school-children, and so connect themselves naturally with the interest already aroused, and carry it further by introducing two of the great Roman ideals, justice and honor. One story is that about the Faliscan school-children and Camillus, who will not do an unjust deed even to secure the capture of a hostile city. The other story is about Virginia, whose father slays his own daughter rather than see her dishonored.

Another reason for selecting this last story was the mention of the Decemviri. The pupils have already seen that the Roman boys learned the Twelve Tables of laws at their schools, as our children learn the Ten Commandments, and their attention can again be called to the profound reverence for law which the Romans had, and which made them the first great missionaries of law and order in this world.

In Lesson IX the lines from Vergil are to be memorized, one sentence after another, to help the pronunciation of the pupils and store their minds with a beautiful picture as well as accustom their ears to the rhythm of Vergil's hexameter. They are also asked to find out who Vergil was.

The second passage in IX has the ideal Roman matron once more, as a home-keeper and wool-worker, whom they have already met in their study of the way the Roman clothing was made, and will meet again in reading of Lucretia. Scipio's sarcophagus connects the Roman tombs with our own, and gives the pupil a bit of early Latin in its original shape, as a living language actually carved on the stone to describe a brave man, and so helps to make the Roman more real.

With Lesson X we take up another great debt which the world owes to Rome. The Romans were the first to build permanent and passable roads, and so bring men near to one another and spread the material and spiritual gains of every people over the whole world. The roads were the material

means by which Rome set up her kingdom of law and order. The story of Lucretia connects itself with the preceding by the model matron which the students will easily guess. Then they will be asked to find Ardea and Collatia and their distance and direction from Rome; and then the question as to how the young man could ride so far in so short a time brings up the subject of roads. A consideration of the condition of our own country before the building of roads will help them to connect the primitive condition of Italy with America and all the world, and so unify their experience. The origin and meaning of the measures of "foot" and "mile" will naturally be asked, and so connect the Roman life still more with all life.

The idea of roads for riding on horseback leads naturally to carriage roads, and Lesson XI gives the picturesque story of the arrival at the Janiculum of Tarquinius Priscus and his wife. The omen of the eagle touches on religion, while the removal of the hat brings in Roman headgear, and the relatively late evolution of a hat and the function of human hair. The genesis of the wagon will be touched on and the students asked to draw the most primitive vehicle they can find described or have seen used. The pupils also locate the Janiculum and Tarquinii.

Lessons VII, VIII, X and XI are simplified from Livy, with an attempt to keep something of his style, and yet have only a few new words and forms in each story, and only such construction as the pupil may be expected to master.

The pupils had been asked to make their own dictionaries and grammars from the first, but it was found that some of them were seriously handicapped by their slowness in copying, and their difficulty in catching the sounds of the language by ear. Consequently we have made the experiment of introducing Collar and Daniell's *First Latin Book*, beginning about the middle of November.

Cæsar: (NINTH GRADE.) We found in the Ninth Grade a large number of students who had been studying Latin for one or more years in text-books based wholly on Cæsar's Gallic War. But as these students were nearly all of them unacquainted with Roman history it seemed unwise to plunge them at once into the battles of Gaul. They would have no idea of the meaning of this great struggle. They must be made to see that Rome had been trying for centuries to establish law and order in the place of battle and barbarism. Consequently these students have spent three months reading in the "Viri Romæ" the story of the Decemviri and Virginia, the capture of Rome by the Gauls, and the later battles with that race; the lives of Tiberius and Caius Gracchus with their attempts to give better law and order to the provincials; the life of Marius, with the terrible struggle once more against the barbarism of Gaul and Germany; the lives of Pompey and Lucullus, and of Cæsar down to his departure for Gaul.

Each student has also been asked to do some special reading for the class, one being responsible for Plutarch's *Marius*, another for his *Pompey*, and another for his *Sertorius*, and another for his *Cæsar*, while others have been asked to report on chapters 1-5 in Beesley's *The Gracchi, Marius and Sulla*, and chapters 1-4 in Merivale's *Triumvirates*. By the study of the physical wall-maps they have seen that the Alps and the Apennines are the two great barriers which have not always kept back the flood of vast and vigorous barbarians of Northern Europe.

As the students begin their Cæsar in January, they will be asked to make a fuller map of the scene of the Gallic wars, especially showing how the mountain ranges

and the plains condition the course of the history and how the level lowlands of Germany could send their hordes of people southward and westward, and so from time to time force the flood of barbarians over the mountain barriers. Into this physical frame-work the students will be asked to fit the Gallic and Germanic ancestors of modern Europe, as described by Cæsar (Bks. I, 1, and VI, 11-24), and with such other information regarding them as the students can assimilate from Kitchin's *History of France* (Bk. I, 1-3), Duruy's *History of the Romans* (ch. 53-54), Harper's Classical Dictionary under *Gallia* and *Germania*, and the encyclopedias under *France* and *Germany*. They will be asked to compare the character and customs of these barbarians with the French and Germans they know about, to see their likeness and unlikeness, and to find out what has caused the change. They will also be helped to compare this roving and warring life with the law and order of the Romans, defective as it is, and they will be asked which of the two is more conducive to the world's welfare.

Then the students will read in Cæsar (Bk. I, 2-5) the story of the attempt of one of the roving, fighting races to leave their narrow boundaries; and they will be asked to find from their maps how the invaders can get out of Helvetia into the country to the south and west, and what measures Rome can and ought to take under the circumstances. Shall she allow the outposts of law and order to be driven in by the barbarians, or shall she extend those outposts still farther, so as to include still more of these gifted races in her great school? When they have given their own answer to this question, they go on in February to read Cæsar and find what answer he gave.

Greek: TENTH GRADE. Greek was begun this year without any text-book, the students being required to prepare their own lexicons and grammars as they needed them, and they made very rapid and satisfactory progress. But as the words and forms increased in number and complexity, it seemed fairer, for a part of the class at least, to have some book that should give them the required material without plunging them into the details of a grammar like Goodwin's or Hadley-Allen's. Consequently, Gleason and Atherton's *First Greek Book* was introduced about the middle of November. The first eight or ten chapters of this book were review to the class and were passed over rapidly. Then we took one chapter at each lesson, and had the students also read as much of our own printed lessons as they found time to prepare.

As pupils show great differences in their ability to read Greek and Latin, we have found it better to ask each one to work a certain time rather than assign the same amount of text for all. In this way the quickest pupil can have enough to do, and can help the slower by translating in the class what he or she has read. We have found it better, also, to divide the references so that different pupils shall have different subjects to study and report to the class. Even the dullest can thus have something of interest to impart to the others.

The reasons for choosing these conversations of Socrates were given last month when the lessons were printed. We wished the pupils to be put in contact with the mighty influence which Socrates came to have on all human life by his searching examinations of the most common topics, filial duty, law, education, brotherly love, and the dignity and duty of labor. How far it will be best to go in pointing out the principles of progress which Socrates revealed, we do not know until we see how far the pupils can receive these ideas. Perhaps we shall find it better to postpone

the discussion of them till we reach the trial and death of Socrates, in the third year of the Greek course.

In connection with these lessons on Socrates, it was planned to have the students learn something of the historic background of Athenian life by reading week by week a brief account of the Persian wars, as found in the easy Greek of Moss's *First Greek Reader*. We shall try the plan of having each student responsible for a different part of the story, though all the class will be expected to follow his translation, so that they will all master the whole story. They will also be expected to follow the story with maps of the places and plans of the battles.

In addition to the references given in the December issue, we shall ask the student to follow the story of the Persian wars in some one of the larger histories of Greece, like Grote's, Curtius', or Duruy's, holding each student responsible for only one of these books. In this way we hope to help the students to acquire the habit of going to the best books for information, and also of watching the reports of the other students to see if there is anything for him to supplement or modify. This method, as applied in some of the Latin classes, has already resulted in several lively discussions between the pupils, making ancient topics very much alive.

Our Thanksgiving Festival included a Greek procession, which served as an admirable prelude to the subject of Greek clothing, to which Socrates refers in one of the talks to be read this month.

Latin Lessons for Ninth Grade

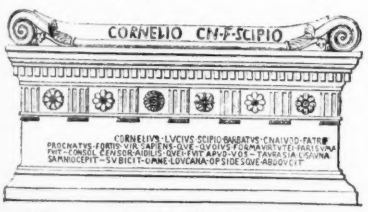
NUMBER III

Latin IX

1. Polyphemus Serenades a Mermaid.

Huc ades, O Galatea; quis est nam ludus
in undis?
Hic ver purpureum, varios hic flumina
circum
fundit humus flores, hic candida popu-
lus antro
imminet, et lentæ texunt umbracula
vites.
Huc ades! insani feriant sine litora
fluctus. Vergilius.

2. The Epitaph of a Fair Roman.



No. 112. SEPULCRUM SCIPIONIS.
A Tomb in Rome.

Hospes, quod dico paulum est, adsta ac
perlege.
Hic est sepulcrum hau pulchrum pul-
chræ feminæ:
nomen parentes nominārunt Claudiam;
suum maritum corde dilexit suo:
natos duos creavit: horunc alterum
in terrā linquit, alium sub terrā locat.
Sermone lepido tum autem incessu
commodo
domum servavit, lanam fēcit. Dixi, abi.

Vocabulary of New Words

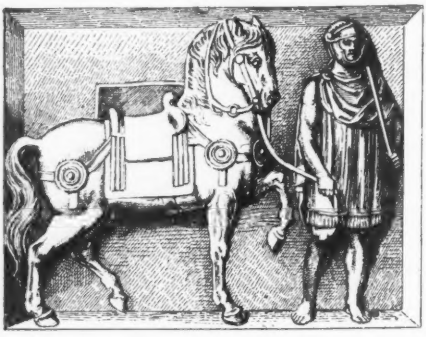
unda, ae, *wave, water.*
ver, veris, *spring-time.*
varius, a, um, *varied, many-colored.*
flumen, inis, n., *river.*
circum, *around.*
fundo, 3, *pour forth.*
humus, i, *ground, earth.*
flos, floris, *flower, blossom.*
populus, i, f., *poplar tree.*
antrum, i, *cave, grotto.*
lentus, a, um, *tenacious, clinging, twining.*
umbraculum, i, *shady bower.*

vitis, is, *vine.*
insānus, a, um, *mad.*
ferio, 4, *strike.*
sino, 3, *allow.*
litus, oris, *shore.*
fluctus, *wave, tide.*
hospes, itis, *host, guest, stranger.*
paulus, a, um, *small, little.*
adsto, 1, *stand by.*
sepulchrum, i, *tomb.*
hau = non
pulcher, chra, chrum, *beautiful.*
nomen, inis, n., *name.*
nomino, 1, *give a name, call.*
marītus, i, *husband.*
cor, cordis, n., *heart.*
natus, *son.*
creo, 1, *produce, bear.*
terra, ae, *earth.*
linquo, 3, *leave.*
loco, 1, *place.*
sermo, onis, *conversation, speech.*
lepidus, a, um, *charming, witty.*
incessus, *walk, bearing.*
commodus, a, um, *fitting, agreeable.*
servo, 1, *guard, keep.*

References: Harper's *Dictionary of Classical Literature and Antiquities*, under *Galatea, Polyphemus, Sarcophagus;* Guhl and Koner's *Life of the Greeks and Romans*, Sec. 77.

Latin X

A Long Ride



No. 113. EQUES ROMANUS.
From a Tombstone in Mayence.

Tarquinius Superbus, rex Rōmānus, Ardeam obsidēbat, ubi regii invenes qui in castris erant conviis interdum tempus terēbant. Forte cenantibus apud Sextum Tarquinium incidit de uxoribus mentio, et suam quisque laudābat miris modis. Inde Tarquinius Collatīnus dixit: "Verbis non opus est. Paucis horis scire possumus ceteris præstāre Lucretiam meam. Quin conscendimus equos visimusque præsentes nostrarum ingenia?"

"Age sanē!" dixērunt omnes.

Itaque citātis equis Romam vehuntur et regias nurus convivio vident tempus terentes. Pergunt inde Collatiam ubi Lucretiam, Collatīni uxorem, serā nocte inter ancillas lanam facientem inveniunt.

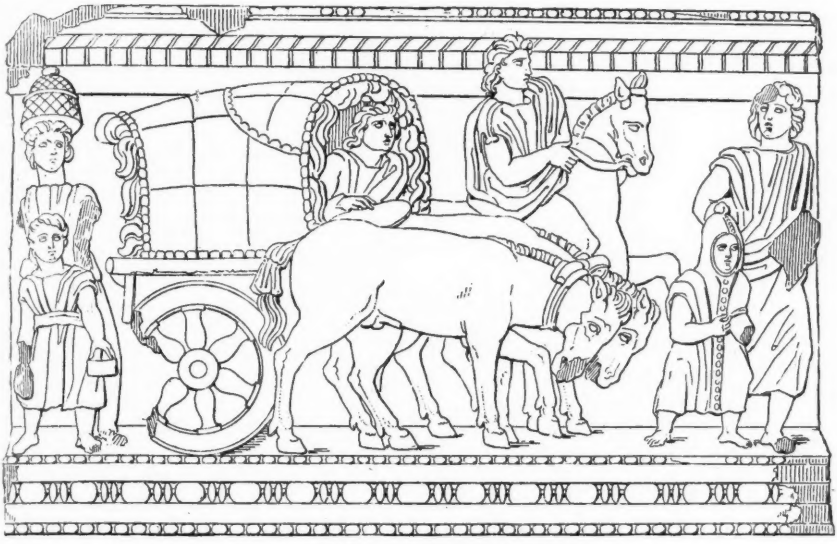
Vocabulary of New Words

rex, regis, *king.*
regius, a, um, *royal*
invenis, *young, youth.*
convivium, *banquet.*
tempus, oris, *time.*
tero, 3, *rub, wear away, spend.*
fors, fortis, *chance.*
ceno, 1, *dine.*
apud, prep., *with, at, at the house of.*
incido, 3, *fall in, happen.*
laudo, 1, *praise.*
mirus, a, um, *wonderful.*
verbum, i, *word.*
opus, eris, *work, need.*
scio, 4, *know.*
præsto, 1, *stand before, surpass.*
conscendo, 3, *mount.*
ingenium, *nature, character.*
citātus, a, um, *quick, at full speed.*
nurus, *daughter-in-law.*
pergo, 3, *press on.*
ancilla, *hand-maiden.*

Questions to be Answered in Latin

1. Quid dixit Collatīnus de uxore suā?
2. Quo modo iuvenes regii Romam ivērunt?
3. Quot fere horis equis citātis ab Ardeā Romam ire potuērunt?
4. Quot horis a Romā Collatiam ire potuērunt?
5. Quā fere horā Collatiam venērunt?
6. Quid faciebat Lucretia?

References: Harper's *Dictionary of Classical Literature and Antiquities*, under *Ephip-*



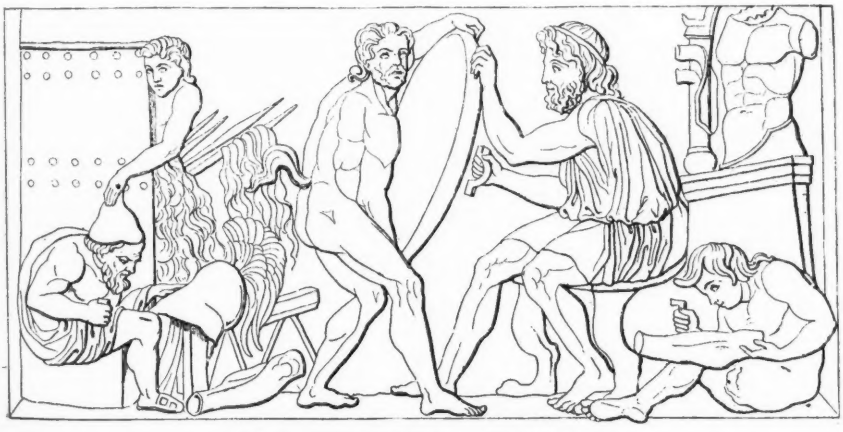
No. 114. VIATOR IN CARPENTO SEDENS.
From an Etruscan Relief.

pium; Rich, *Dictionary of Roman and Greek Antiquities*, under *Eques;* Smith's *Dictionary of Greek and Roman Geography*, under *Ardea, Collatia.*

Latin XI

A Lucky Omen

L. Tarquinius Priscus ab Tarquiniis cum fortunis omnibus Romam migrāvit. Postquam ad Ianiculum vēnit ei carpento cum uxore sedenti aquila pilleum aufert superque carpentum cum magno clangōre volitans rursus capiti apte repōnit. Tanaquil uxor, cælestium prodigiōrum perīta, alta sperāre virum iubet, qui postea regnum occupāvit.



No. 115. PUER PILLEUM FABRI AUFERT.
Hephaestus' Blacksmith Shop on a Greek Vase.

Vocabulary of New Words

migro, 1, *move, remove.*
aquila, *eagle.*
anfero, 3, *take away, carry off.*
clangor, ōris, *noise.*
volito, 1, *fly to and fro, flutter.*
caput, itis, *head.*
repōno, 3, *replace.*
perītus, a, um, *experienced, expert.*
altus, a, um, *high, lofty.*
spero, 1, *hope for, expect.*
iubeo, 2, *command, bid.*
regnum, *royal power.*
occupo, 1, *seize.*

Questions to be Answered in Latin

1. Ubi habitābat Tarquinius Priscus?
2. Quo modo migravit Romam?
3. Quid fecit aquila?
4. Quid dixit Tanaquil?
5. Hominesne in urbe Romā carpento vehebantur?

References: Harper's *Dictionary of Classical Literature and Antiquities*, under *Tarquinii, Tarquinius, Carpentum, pilleus;* Rich, *Dictionary of Roman and Greek Antiquities*, under *Carpentum, pileus;* Schreiber's *Atlas of Classical Antiquities*, Plate 62.

Latin XII

The Roman Women Help the State

Camillus dum Veios obsidet decimam partem prædæ Apollini vōvit. Sed urbe captā vōtum exsolvere Romani non potuērunt quia aurum satis non habuērunt. Deinde matrōnæ ad id consultandum convenērunt communique decrēto aurum et omnia ornamenta sua in ærarium detulērunt. Itaque ob eam munificentiam matrōnis pilento ad sacra ludosque, carpentis festo profestoque ire licuit.

Nunc mihi curto
Ire licet mulo vel si libet usque Tarentum.
—*Horatius.*

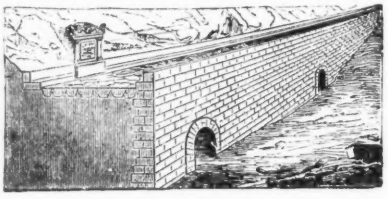
Vocabulary of New Words

decimus, a, um, *tenth.*
præda, *booty.*
voveo, 2, *vow;* vōtum, *a vow.*
exsolvo, 3, *pay off.*
convenio, 4, *come together.*
decrētum, *decision.*
ærarium, *treasury.*
defero, 3, detuli, *carry down, carried down.*
munificentia, *liberality.*
licet, *is allowed.*

No. 116. VIATOR CANPONÆ PRO CIBO SOMNOQUE PECUNIAM DAT.
From a Tombstone in Italy.

Questions to be Answered in Latin

1. Quid fēcit Camillus dum Veios obsidet?
2. Cur Romani votum non exsolvērunt?
3. Quid fecērunt matronæ?
4. Quem honorem eis dedit senatus?
5. Quo modo ferebantur aliæ feminæ in urbe Romā?
6. Quo modo Horatius poeta usque Tarentum ire potuit?
7. Quot diēbus Tarentum ire potuit?
8. Ubi potuit viator cibum somnumque capere?
9. Qui primus viam publicam munīvit?



No. 117. VIA APPIA.
From Guhl and Koner's Life of the Greeks and Romans.

References: Harper's *Dictionary of Classical Literature and Antiquities*, under *Veii, Apollo, Ludi, Caupōna, Via;* Rich, *Dictionary of Roman and Greek Antiquities*, under *Pilentum, Via;* Guhl and Koner's *Life of the Greeks and Romans*, Secs. 104, 105 and 71.

Latin Lessons for Ninth Grade

NUMBER IV

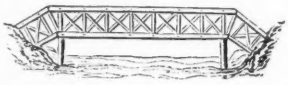
Latin XIII

Horatius at the Bridge

Ancus Martius, rex Romanōrum, Ianiculum urbi ponte sublicio coniunxit, qui postquam reges expulsi sunt iter pæne hostibus dedit. Nam Porsena Clusīnus rex repentīno impetu Ianiculum cēpit et infesto exercitu ad pontem vēnit, cuius extrēmam partem Horatius Cocles unus occupāvit. Is vir hostium impetum sustinuit dum pons a tergo interrumpitur. Tum ponte interrupto Cocles, "Tiberine pater," inquit, "te precor, hæc arma et hunc militem propitio flumine accipias." Ita sic armatus in Tiberim desiluit incolumisque ad suos tranavit.

Vocabulary of New Words

coniungo, 3, *unite.*
iter, itineris, *route, way.*
hostis, is, *enemy.*
repentīnus, a, um, *sudden.*
impetus, *attack.*
infestus, a, um, *hostile.*



No. 118. PONS SUBLICIUS.
From the Column of Antoninus.

interrumpo, 3, *break down.*
precor, 1, *pray.*
flumen, inis, *stream.*
desilio, 4, *leap down.*
incolumis, *safe.*
trano, 1, *swim across.*

Questions to be Answered in Latin

1. Qui primus pontem sublicium fēcit?
2. Quibus hostibus iter pæne dedit is pons?
3. Qui sustinuit impetum hostium?
4. Quid dixit Cocles Tiberino patri?
5. Quo modo Cocles ad suos venit?
6. Potuitne populus Romanus sine pontibus viisque imperium suum constituere?

No. 119. PONS ÆLIUS.
The Ponte S. Angelo, from Guhl and Koner's Life of the Greeks and Romans.

References: Harper's *Dictionary of Classical Literature and Antiquities*, under *Cocles, Clusium, Porsena, Pons, Via;* Rich, *Dictionary of Roman and Greek Antiquities*, under *Pons, Sublicius, Via;* Guhl and Koner's *Life of the Greeks and Romans*, Secs. 71 and 72; Macaulay's *Horatius.*

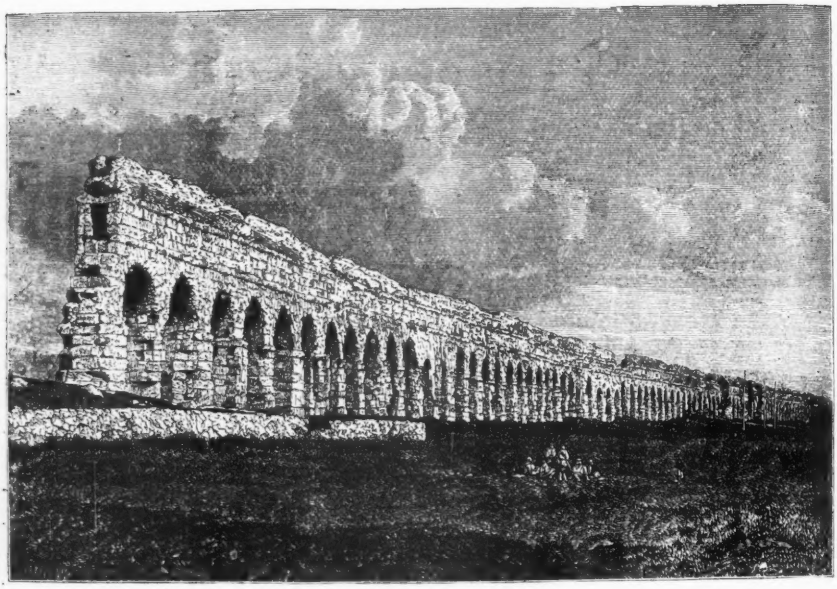
Latin XIV

A Recreant Roman Maiden

Sabini Romulo regnante arcem Romanam obsēdērunt, cui Tarpeius præerat, et Tarpeia, filia sua, dum aquam extra mœnia petit armillas aureas gemmatosque anulos vidit quos Sabini in bracchiis lævis gerebant. Eorum ornamentorum avida puella Romana dixit Sabinis, "Si id dabitis quod in bracchiis lævis geritis, vos in Capitolium ducam." Sed ubi in arcem ivērunt puellam scutis obruerunt quia et illa in lævis gerebant.

Dominus servum iubet:

Tu qui urnam habes, aquam ingere, face plenum aënum sit cito. *Plautus.*



No. 120. AQUA CLAUDIA.
A Roman Aqueduct To-day, from Duruy's History of the Romans.

No. 121. PUELLÆ GRÆCÆ URNAS FERENTES.
From a Greek Vase.

Vocabulary of New Words

regno, 1, *reign, rule.*
arx, arcis, *citadel.*
præsum, *be in front, be in command.*
extra, prep. with acc., *outside.*
mœnia, ium, *fortifications, walls.*
peto, 3, *seek.*
armilla, æ, *bracelet.*
anulus, i, *ring.*
lævus, a, um, *left.*
avidus, a, um, *eager for.*
scutum, i, *shield.*
aĕnum, i, *copper vessel.*

Questions to be Answered in Latin

1. Ubi petivit Tarpeia aquam?
2. Quo modo eam ferebat?
3. Quorum ornamentorum avida fuit puella?
4. Qua arma ei dabant Sabini?
5. Ubi petēbant servi aquam postquam ea in urbem ducta est?
6. Qui primus aquam in urbem duxit?

References: Harper's *Dictionary of Classical Literature and Antiquities*, under *Aquæ Ductus, Fons, Tarpeia;* Guhl and Koner's *Life of the Greeks and Romans*, Sec. 74; Schreiber's *Atlas of Classical Antiquities*, Plate 67 and 68.

Physiography: Ninth Grade (WALLACE W. ATWOOD.) — During the fall quarter the work in this course was a study of the geographic environment of Chicago. Whatever was done in the class-room was based on the field study carried on during the early part of the quarter, with the aim of having the students understand and appreciate what was going on about them.

These same students are studying Grecian history and the Latin language, and therefore it is desirable that they have an appreciation of the physiographic conditions in those regions where the Greek and Roman civilizations developed.

For this reason the attention of the class, in this course, will be focused on the physiography of the Mediterranean Sea region, including not only a study of the physical geography of the land, but a consideration of the climatic and hydrographic conditions in that part of the world.

The general geography has been covered, somewhat fully, with the students of this grade, in the other courses, and our investigations will begin with a study of the climate:

I. Elements of climate, or what we want to know about the climate of any region.

1. Temperature: (a) Average. (b) Average yearly range. (c) Average daily range (d) Average during the growing period. (e) Average during cold period. (f) Secure similar data for Greece and Italy.

2. Rainfall: (a) Total annual amount. (b) Distribution throughout the year. (c) Distribution over surface. (d) Rainfall for Greece and Italy.

3. Winds: (a) Prevailing winds, direction and average velocity. (b) Periodic winds, direction and average velocity. (c) Special storm winds. (d) Winds for Greece and Italy.

II. Factors which influence climate.

1. Latitude.
2. Altitude.
3. Relation to sea: (a) Distance from sea. (b) Where there are warm currents. (c) Where there are cold currents. (d) Relation of Greece and Italy to sea.
4. Relation to physical features: (a) On windward or leeward side of high mountains. (b) On windward or leeward side of great plains or deserts. (c) Windward and leeward sides of Greece and Italy during different seasons.
5. Position relative to wind belts or storm tracts. Special changes in southern Europe during the year.

III. Keeping of weather records.

1. The Thermometer: (a) Fahrenheit. (b) Centigrade. (c) The fixed points and how to determine them. (d) Comparison of degrees. (e) Special thermometers for extremes of temperature. (f) Maximum and minimum thermometers. (g) The thermograph.
2. The Barometer: (a) Making of the barometer. History of the experiment. (b) Aneroid barometers.
3. Anemometers.
4. The Rain-gauge.

5. Recognition of different cloud forms: (a) Cirrus. (b) Cirro-stratus. (c) Cirro-cumulus. (d) Alto-stratus. (e) Stratus. (f) Cumulus. (g) Alto-cumulus. (h) Nimbus. (i) Cumulo-nimbus.

IV. The weather map.

1. The isobars.
2. The isotherms.
3. The devices for showing on the map, clear or cloudy conditions, rain or snow, direction of wind.
4. The areas marked "Low": (a) Arrangement of pressure. (b) Arrangement of temperature. (c) Arrangement of winds.
5. The areas marked "High": Same analysis as for "Low."
6. Weather conditions in "Low" and in "High."

V. Circulation of the atmosphere.

1. Observations based on wind charts: (a) The calm belts. (b) The trade wind belts. (c) The belts of westerlies. (d) The low-pressure belts. (e) The high-pressure belts. (f) Countries located in these different belts. (g) In which belt is Greece? In which belt is Italy?
2. Explanation of these facts.
3. Some more observations: (a) Monsoon winds. (b) Land and sea breezes. (c) Cyclonic winds. (d) Anticyclonic winds. (e) Typhoons. (f) Tornadoes. (g) Hurricanes. (h) Chinooks. (i) Northers. (j) Countries located where these periodic winds blow. (k) Storms of southern Europe.
4. Explanation of these observations.
5. Influence of the storms on mankind.

References: Davis, *Physical Geography;* Tarr, *First Book in Physical Geography;* Davis, *Elementary Meteorology;* Waldo, *Meteorology.* The Government weather maps.

Art Expression Work in Physiography: NINTH GRADE: I. Water-color paintings of various cloud forms.

II. Water-color paintings of various landscapes typical of:

1. Arid or desert region.
2. Prairies.
3. Steppes.
4. Tundras.
5. Well-watered mountain-sides.
6. Poorly watered mountain-sides.
7. Forests of temperate zones.
8. Tropical forests.

III. Chalk modeling of landscapes similar to those chosen for painting.

History: (GUDRUN THORNE-THOMSEN.) The work in History in Ninth, Tenth, and Eleventh Grades for the months of January and February will be a continuation of the course outlined for December, and will cover the period in Greek history following the Homeric Age and extending to the Persian wars.

Particular attention will be given to the evolution of government and the growth of institutions both social and political as they gradually unfolded themselves during this period from their beginnings in prehistoric times. The different forms of government will be studied in their relation to the life of the people, as an expression of social ideals and tendencies; e. g., in Athens, where the struggle toward democracy reflected the whole social organization and progress of the city.

For the study of the topics outlined below the pupils will be referred to chapters in their text-book, Botsford, *A History of Greece,* as well as to books in the library (see list of references in December outline). These topics will be taken up in a logical or chronological order, as suggested by the text-book, only in so far as it agrees with the progress and needs of the class at the time; they do not present the whole scope of the work, but rather the essential points around which the discussion will center. Facts concerning the period will be obtained from books, but generalizations, inferences, and estimates of persons and events will be worked out by the pupils themselves.

In order better to understand the powers of the various political bodies, the class will organize itself into a monarchy, oligarchy, or democracy, as the case may be. Lawsuits may be brought before the courts and new laws proposed, the pupils endeavoring to dramatize the scenes as they actually took place.

To make the picture of the life of the

Greeks vivid, we shall imagine ourselves in Sparta or Athens and see the people in their daily pursuits dressed in the costumes of the time. We shall go to the market-place and listen to the talk of the townsmen; visit the courts, and also the town hall where the sacred fire is burning; attend the meetings of the council and the assembly; and in general watch the life of the Athenian or Spartan at home and in public places. At the harbor of Athens, the vessels as they come in and go out will give us an idea of the commerce of the city. We shall go on board one of these vessels and set sail for some of the distant colonies. In the schools we shall see what the children and youths are doing, and in the temples learn of the religious worship of the people. From what we see we shall make inferences concerning the government of the city and endeavor to trace its development.

In this study the following outline is suggested:

What determines the formation of the Greek state? The city as the political unit in Greece. The evolution and organization of the city state. The cohesive force in early Greek society, religious worship, and kinship. The walled city and its relation to surrounding country. Comparison between our modern state and the Greek. Geographical conditions favoring the formation of city states. Function of the king in early Greek society. Rights of the king limited by the council, showing position and power of the nobility. Limited by the assembly, showing political rights of the masses. Limited by traditional customs.

Compare Greek monarchies with despotic monarchies of the East.

The pupils will work out a map showing extent of the Greek world. Founding of colonies; reasons for colonization, commercial, political, etc. Relation of colonies to parent city; organization of a colony; Greek method of colonization compared with that of modern countries. Influence of Greek colonization on the progress and civilization of the world.

Was Hellas a geographical unit? A political unit?

Difficulties in the way of political federation.

Why was the local interest of the Greek city state so strong? Reference to the geography of Greece.

Present physical map of Greece, showing isolated areas; diversity in resources and occupations, and consequent variety of interest of the city states.

Co-operation of states for religious purposes: (a) The Delian League; (b) The Delphic Amphictyony. How religious leagues became political hegemony. The Peloponnesian League. Compare this loose union of states with the United States. What made the states of Greece with their colonies feel like one nation? Elements of Hellenic unity. Language and literature. The Homeric poems. Common religion. Religious festivals; the Delphic oracle; Olympic games. Customs, manners, culture, and art. Stage of civilization reached by surrounding peoples (barbarians).

ATHENS: Myths concerning the beginnings of the city. How Attica became a state; its organization and the influence of Athens. Geography of Attica. Importance of Acropolis in early times. Steps in the evolution of the government of Athens from monarchy to democracy. Efforts of the nobles to reduce king's power. Knightly aristocracy or oligarchy. Transition from oligarchy to timocracy. Division of people into four classes. Political power determined by wealth. Party strife. Sectional classes of Athens. The nobles as custodians of laws. Draco's work for Athens. His laws of homicide.

Growth of commerce and industries. Economic misery of the lower classes. The legislation of Solon. Changes in the constitution.

Rights of the political parties under Solon. Did the constitutional reforms of Solon bring about a democracy? What class had still the controlling power in Athens? Solon's own account of his work. Compare political institutions of Athens with those in our own country.

Pisistratus, the tyrant. Benefits conferred on the Greek commonwealth by the tyrannies. Advantages to the Greek people of gradual transition from oligarchy to democracy. Difference between king and tyrant. Pisistratus' work for Athens. Growing appreciation of Solon's constitution by the masses.

Clisthenes as the founder of democracy in Athens. Constitutional reforms introduced by Clisthenes. Public work without compensa-

tion; consequences. Effect of these reforms on the people of Athens as shown in succeeding events.

SPARTA. Myths concerning beginnings of the city; the Dorian migrations. Relation of Spartans to conquered people. Compare with Athens. Political rights of outside country. The three classes.

The position of the Spartans in Lacedæmon was like that of a garrison in a hostile country; the whole social and political structure was adapted accordingly, and war became the business of life. Entire subordination of the individual and the family to the state. How the state provided for the individual. Cultivation of the land by the helots. Aims and methods of Spartan education. Political organization. The dual kingship. Power of the kings of the council and assembly. The five ephors. Sparta as an aristocracy. In what sense was it a democracy?

As Sparta and Athens represent entirely different ideals in government, a close comparison between the two cities will be made. Influence of the two cities upon Greece. Communistic organization of Spartan society. Individualistic organization of Athenian society. Effect on material progress and attitude toward work in the two states.

Art in Connection with History: (JOHN DUNCAN.) Taking the Mycenæan pottery as the inspiration, the students of the First, Second, and Third years will mold and decorate vases, candlesticks, flowerpots, and jardinières. The students will first be familiarized with the form of pottery belonging to that age through the medium of pictures and slides, and will then proceed to adapt them to their own uses, and to invent new patterns for themselves.

German:

Die Loreley.

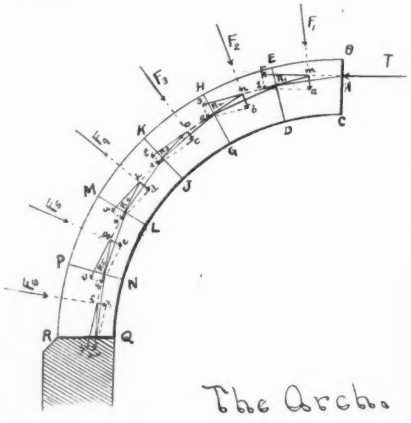
Ich weiß nicht, was ſoll es bedeuten,
Daß ich ſo traurig bin;
Ein Märchen aus uralten Zeiten,
Das kommt mir nicht aus dem Sinn.
Die Luft iſt kühl, und es dunkelt,
Und ruhig fließet der Rhein;
Der Gipfel des Berges funkelt
Im Abendſonnenſchein.

Die ſchönſte Jungfrau ſitzet
Dort oben wunderbar;
Ihr gold'nes Geſchmeide blitzet,
Sie kämmt ihr goldenes Haar.
Sie kämmt es mit goldenem Kamme
Und ſingt ein Lied dabei,
Das hat eine wunderſame,
Gewalt'ge Melodei.

Den Schiffer im kleinen Kahne
Ergreift es mit wildem Weh';
Er ſchaut nicht die Felſenriffe,
Er ſchaut nur hinauf in die Höh'.
Ich glaube, die Wellen verſchlingen
Am Ende Schiffer und Kahn:
Und das hat mit ihrem Singen
Die Loreley gethan.

Heinrich Heine.

Mathematics: (GEORGE W. MYERS.) I. Geometry: The special work of this grade being the study of Greece, the geometry of certain architectural forms will be taken up. Chief among these forms will be the arch, the truss, the column, and the dome. The half-arch shown in the figure is held in equilibrium by the horizontal thrust T, the reaction of the right half of the arch. The block B, C, D, E is held in equilibrium by the forces T, F, and the reaction of the block E, D, G, H (called *Voussoir*). Each Voussoir is in a similar condition to this, the direction, intensity and point of application of the reactions R_1, R_2, R_3, etc., being determined by the principle of the *parallelogram*, or *triangle of forces*. (See October and November COURSE OF STUDY under Pedagogic School). The Criteria of Safety for an arch are:

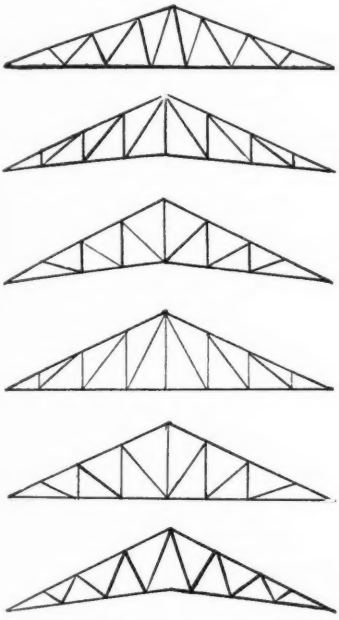


(1) To prevent overturning, it is necessary that the line of resistance, A, R_1, R_2, R_3, R_4, R_5, R_6, shall lie everywhere between the arcs C, D, G, J, L, N, Q (the *intrados*) and B, E, H, K, M, P, R (the *extrados*).

(2) To prevent crushing, the line of resistance must cross the joint far enough from the edge so that the maximum pressure shall be less than the crushing strength of the stone.

(3) To prevent sliding, the angle between the line of resistance and the normal to the joint must be less than the angle of friction of the surfaces.

The truss will be taken up with sufficient detail to show how the forces act within and upon it, and the geometry that underlies its construction. The dome is an arch revolved about its vertical axis through 180°. Some of the simpler forms of trusses are given here.



This with some remarks on the column will show the need of a study of the triangle and allied rectilinear figures, and necessitate about as much as is usually given in Book I.

As the study of the geography of Greece necessitates a knowledge of local environment, the field-work in geometry will be directed toward the construction of a careful topographic map of a local area, perhaps of the south end of Lincoln Park. The geometry will be worked out of the problems which grow out of the field-work, after the manner suggested by the three propositions below.

(4) Any two geometrical figures, such as lines, angles, triangles, quadrilaterals, etc., are said to be equal if when superposed they coincide throughout. (Congruency.)

The lines, angles, etc., which make up a geometrical figure are called its *parts*. Parts which are similarly situated with respect to the lines, angles, etc., of a figure are called corresponding or homologous *parts*.

The corresponding parts of equal figures are obviously equal.

When two lines cross, or cut, each other they are said to *intersect*.

How many straight lines can be drawn through a single point?

How many straight lines can be drawn through two fixed points?

Can a straight line always be drawn through two fixed points?

A line is said to be *determined* by points when one line, and only one, can be drawn through them.

What is the least number of points which will determine a straight line?

Can three points ever determine a line? Why do they not always?

Points are *located*, or *fixed*, on paper by means of pen or pencil dots; on the blackboard, by crayon dots; on the ground, by chaining-pins or flag-poles; a straight line is *located*, or *fixed*, on the ground by fixing two points lying in it.

Field-Work: Locate two intersecting straight lines on the surface of a level tract of ground, and set up a compass, or plane table, over the point of intersection. Measure carefully all four of the angles. What angles are equal?

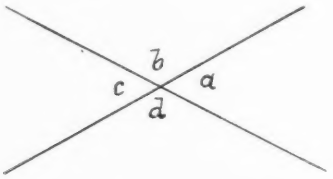
Remark: A very useful plane table can be made at an expense not to exceed $1.50 by screwing to a 75-cent flat-topped camera tripod a light drawing-board, and using a small 25-cent level, which can be had of any hardware dealer, to level up with. A cheap (5-cent or 10-cent) foot-rule with needles set vertically in it will serve for an *alidade*, or sight.

Drawing Exercise: Draw two intersecting straight lines on paper, and with a protractor measure all four angles. Which angles are equal?

When two straight lines meet, the two angles lying on opposite sides of the same line are called adjacent angles, as a and b, or a and d, etc.

Two angles lying on opposite sides of both

lines are called opposite, or vertical, angles, as a and c, or b and d.

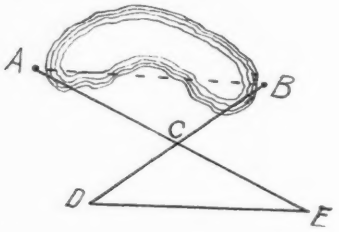


Exercise: Cut the paper along the two intersecting lines, and fit the angles over each other, and state in geometrical terms which angles are equal.

Demonstration

PROPOSITION I: *Opposite, or vertical, angles are equal.* Prove.

Let it be desired to find the length, A, B, of the lagoon.



Field-Work: Let flag-poles be set up at A, B and some convenient third point, C. Prolong the lines BC and AC through C, making CD equal to BC and CE to AC. Set up poles at D and E and chain the distance DE.

Drawing Exercise: Draw on paper three lines, such as AB, AC, and BC, then prolong AC and BC, as above, until CE and CD are equal respectively to AC and BC. Draw DE, and cut out the figure CDE. Can you place it upon ACB so that it will fit? What relation holds between DE and AB?

Try this same exercise, prolonging AC to E, making CE equal to BC, and extending BC to D, making CD equal to AC, and connecting DE. Cut out the figure CDE, and fit it over ACB as before. What relation between DE and AB?

In both cases what parts of the triangles were constructed equal? What principle does your experiment seem to show?

Define proposition and demonstration, and illustrate the definitions by the following:

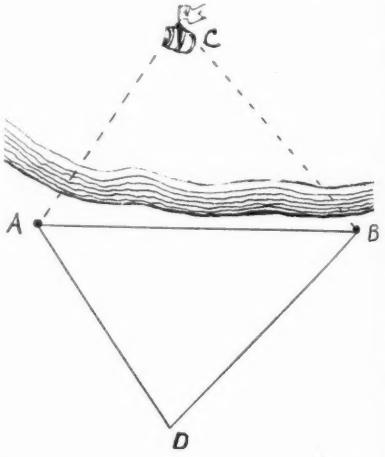
Demonstration

PROPOSITION II. *When two sides and the included angle of one triangle are equal respectively to two sides and the included angle of another, the triangles are equal.* Prove.

Remark: The substance of this proposition is sometimes stated thus: A triangle is *determined* by two sides and the included angle.

Query: Can you draw and cut out any triangles having the same two sides and included angles which will not exactly fit over each other, or *coincide?*

Find the distances from the buoy, C, to the points A and B on shore.



Field-Work: Locate the line AB by placing flag-poles at A and B, or at any other two (why two?) points along AB. With a plane table, or compass, set up over A, measure the angle CAB, and set a flag-pole out along the direction AD, making BAD equal to CAD. Similarly at B, measure angle ABC, and set a flag-pole out in the direction BD, so that ABD shall equal ABC. Then prolong AD and BD until they intersect, and set a pole at the point of intersection. Finally, chain AD and BD.

Drawing-Work: With ruler and protractor draw this figure in small with as great accuracy as possible. Cut the paper along the lines AD and BD, and fold the figure ADB over the line AB, bringing it into the plane of the figure ACB. Does ADB fit closely (coincide with) ACB?

Would the problem have been solved by making angle BAD equal to angle ABC, and

angle ABD equal to angle BAC? What line would you then have measured for BC? for AC?

In the field-work, what particular parts were measured? Upon what common feature does the equality of the two triangles ACB and ADB seem to depend here?

Demonstration

PROPOSITION III: *If two angles and the included side of one triangle are equal respectively to two angles and the included side of another, the triangles are equal.* Prove.

II. **Algebra:** The great superiority of the methods of algebraic analysis over those of arithmetic in dealing with complicated numerical relations is perhaps sufficient reason in itself for retaining algebra as a part of the common school course. To many this is the only office algebra ever performs; but this is not the most important function of the subject. The fact that it is fundamental to all more advanced mathematical studies, including Physics, Mechanics, Astronomy, and all the engineering sciences, has led some to think that it is the most needed, and from lack of skill in handling it is the least used of the modern industrial fabric. Substantially all there is of Trigonometry is derived from the algebraic transformation of the following six simple relations:

$s^2+c^2=1$; $t=s/c$; $T=1/t$; $S^2=1+t^2$ and $C^2=1+T^2$; $v=1-c$.

Assuming these relations, prove the following equations:

(1) $\frac{t-s}{s^3}=\frac{S}{1+c}$;

(2) $ct+sT=s+c$;

(3) $(2-v)v=s^2$;

(4) $\frac{c}{sT^2}=t$;

(5) $(t+T)sc=1$;

(6) $(S^2-1)(C^2-1)=1$;

(7) $SC(c^2-s^2)=T-t$;

(8) $(s+c)(t+T)=S+C$;

(9) $T+\frac{s}{1+c}=C$;

(10) $s(S+C)-c(S-C)=SC$;

(11) $(C-T)^2=\frac{1-c}{1+c}$;

(12) $(1+t^2)(1-T^2)=S^2-C^2$;

(13) $\frac{t-T}{t+T}=\frac{2}{C^2}-1$;

(14) $S^2C^2-2=t^2+T^2$;

(15) $T-SC(1-2s^2)=t$;

(16) $C(S-1)-T(1-c)=t-s$;

(17) $v(S+1)+(1-s)(C+1)=st+cT$;

(18) $\frac{v(1+S)}{s}+\frac{(1-s)(1+C)}{c}=SC$;

(19) $s^2(t^2-1)+c^2(T^2-1)=(1-2c^2)^2S^4$;

(20) $c^4-s^4=c(1-t)(s+c)$.

Eleventh and Twelfth Grades

American History in the Twelfth Grade: (EMILY J. RICE.) The Revolutionary Period is our subject of study for January. Much original material may be found for this work in Hart's *Contemporaries and Source Book*, American History Leaflets, Old South Leaflets, and *Source Extracts*, by Caldwell.

To illustrate the different methods of argument of the English statesmen on the one hand and the American on the other in regard to taxation, a few other extracts from original material have been selected. Our aim is to show the theoretical reasoning of the Americans in contrast to the practical thought of the English. These selections, with some illustrations of the spirit of the times, are given below. Extracts from Locke's *Treatise on Civil Government* may also aid in this work.

DISCUSSION OF THE STAMP ACT IN THE BRITISH PARLIAMENT

George Grenville: "The colonies have a right to demand protection from parliament, and parliament, in return, has a right to enforce a revenue from the colonies; protection implies an army, an army must receive pay, and pay requires taxes; on the peace, it was found necessary to maintain a body of ten thousand men at a cost exceeding three hundred thousand pounds, most of which was a new expense; the duties and taxes already imposed or designed would not yield more

than one hundred thousand pounds, so that England would still have to advance two-thirds of the expense; it was reasonable for the colonies to contribute this one-third part of the expense necessary for their own security." (Adapted.)

Jackson: "The parliament may choose whether they will tax America or not; they have a right to tax Ireland, yet do not exercise that right. Still stronger objections may be urged against their taxing America. Other ways of raising the moneys there requisite for the public service exist, and have not yet failed; but the colonies in general have with alacrity contributed to the common cause. It is hard all should suffer for the fault of two or three. Parliament is undoubtedly the universal, unlimited legislature of the British dominions, but it should voluntarily set bounds to the exercise of its power; and if the majority think they ought not to set these bounds, then they should give a share of the election of the legislature to the American colonies, otherwise the liberties of America, I do not say will be lost, but will be in danger; and they cannot be injured without danger to the liberties of Great Britain."

For the argument of William Pitt, see Hart's *Contemporaries*, vol. 2, p. 404.

The Stamp Act as Discussed by American Colonists

Virginia House of Burgesses. Resolutions written by Patrick Henry, and adopted:

Resolved, That the first adventurers and settlers of this, his majesty's colony and dominion, brought with them and transmitted to their posterity, and all other of his majesty's subjects, since inhabiting in this his majesty's said colony, all the privileges, franchises, and immunities that have been at any time held, enjoyed, and possessed by the people of Great Britain.

Resolved, That by two royal charters granted by King James the First, the colonists aforesaid are declared entitled to all the privileges, liberties, and immunities of denizens and natural born subjects to all intents and purposes, as if they had been abiding and born within the realm of England.

Resolved, That the taxation of the people by themselves, or by persons chosen by themselves to represent them, who can only know what taxes the people are able to bear, and the easiest mode of raising them, and are equally affected by such taxes themselves, is the distinguishing characteristic of British freedom, and without which the ancient constitution cannot subsist.

Resolved, That his majesty's liege people of this most ancient colony, have uninterruptedly enjoyed the right of being thus governed by their own assembly in the article of their taxes and internal police, and the same hath never been forfeited, or any other way given up but hath been constantly recognized by the King and people of Great Britain.

Resolved, therefore, That the general assembly of this colony have the sole right and power to lay taxes and impositions upon the inhabitants of this colony; and that every attempt to vest such power in any persons whatsoever, other than the general assembly aforesaid, has a manifest tendency to destroy British as well as American freedom. (Fifth rescinded.)

Plymouth Town Meeting: "This place, sir, was at first the asylum of liberty, and we hope will ever be preserved sacred to it, though it was then no more than a barren wilderness, inhabited only by savage men and beasts. To this place our fathers (whose memories be revered), possessed of the principles of liberty in their purity, and disdaining slavery, fled to enjoy those privileges which they had an undoubted right to, but were deprived of by the hands of violence—oppression in their native country. We, sir, their posterity, the freeholders and other inhabitants of this town, legally assembled for that purpose, possessed of the same sentiments and retaining the same ardor for liberty, think it our indispensable duty on this occasion to express to you these our sentiments of the stamp act, and its fatal consequences to this country, and to enjoin upon you (delegates), as you regard not only the welfare, but the very being of this people, that you (consistent with our allegiance to the King and relative to the government of Great Britain), disregarding all proposals for that purpose, exert all your power and influence in opposition to the stamp act, at least till we hear the success of our petitions for relief. We, likewise, to avoid disgracing the memory of our ancestors, as well as the reproaches of our own consciences, and the curses of posterity, recommend it to you to obtain if possible in the honorable house of representatives of this Province, a full and explicit assertion of our rights, and to have the same entered on their public records, that all generations yet to come may be convinced that we have not only a just sense of our rights and liberties, but that we never with submission

to Divine Providence will be slaves to any power on earth."

For the Stamp Act Congress, see Hart's *Contemporaries*, Vol. II, p. 402. See also *Principles and Acts of the Revolution*.

General Gage's letter, written at New York: "It is difficult to say, from the highest to the lowest, who has not been accessory either by writing or by mutual agreements to oppose the act, by what they are pleased to term all legal opposition to it. Nothing effectual has been proposed either to prevent or quell the tumult.

"The rest of the provinces are in the same situation as to a positive refusal to take the stamps, and threatening those who shall take them to plunder and murder them; and this affair stands in all the provinces that unless the Act, from its own nature enforce itself, nothing but a very considerable military force can do it."

THE REPEAL OF THE STAMP ACT

English Parliament, House of Lords. Lord Shelburne: "Before we resolve upon rash measures, we should consider first the expediency of the law and next our power to enforce it. The wisest legislators have been mistaken. The laws of Carolina, though planned by Shaftesbury and Locke, were found impracticable and are now grown obsolete. The Romans planted colonies to increase their power; we, to extend our commerce. Should the regiments in America, at Halifax or Pensacola, embark at once upon the same destination, and no intervening accident disappoint the expedition, what could be effected against colonies so populous and of such magnitude and extent? The colonies may be ruined first, but the distress will end with ourselves."

Halifax, and others: "Protection without dependence and obedience is a solecism in politics. The connection between Great Britain and her colonies is that of parent and child. For the parent not to correct the undutiful child would argue weakness. The duty to enforce obedience cannot be given up, because the relation cannot be destroyed. The King cannot separate his colonies any more than any other part of his dominions from the mother country, nor render them independent of the British legislature. The laws and constitution of the country are prior and superior to charters, many of which were issued improvidently and ought to be looked into."

"The eyes of all the House turned upon Pitt as he rose in his place; the Americans present in the gallery gazed at him as at the appearance of their good angel or savior." (Bancroft.)

Pitt: (He had said that his resolution was taken.) "If I can crawl or be carried, I will deliver my mind and heart upon the state of America. I approve the address in answer to the King's speech; for it decides nothing and leaves every member free to act as he will. The notice given to parliament of the troubles was not early and it ought to have been immediate. I speak not with respect to parties. I stand up in this place single, unsolicited and unconnected. As to the late ministry, every capital measure they have taken is entirely wrong." See Bancroft, Vol. III, p. 175.

Burke's *Conciliation with America* will be the literature study for the period.

Art in Connection with History: (JOHN DUNCAN.) The students of the fourth year High School will devote themselves during this quarter to the making of decorative and illustrative pictures for their own and other rooms of the school. They will also assist the general committee on decoration in arranging the building for special exercises and festivals. This will involve work in very various directions, making a considerable demand for originality, and as much of it will be on a large scale the students will gain in confidence or facility.

Latin, Eleventh Grade: (ALLEN W. GOULD.) We had planned to begin Cicero's first oration against Catiline the first of December, but we did not do so until the middle of the month. We took more time with Sallust, for the sake of bringing out clearly in the speeches of Cæsar and Cato the meaning of the Roman Senate as a great school where the Romans could be educated to govern themselves and so govern the whole world, by hearing all sides of each subject freely discussed. Then the question naturally arose, what power should govern the governors of the province, and why had this great and growing domain of law and order no representative government like our own?

The careful study of these two great and opposing characters — Cæsar and Cato — prepares the student to anticipate what their views will be in the crisis. And as we pass into Cicero's orations we meet another character, and are to look at the same crisis through his eyes. This way of approach seemed to give the pupils a keen interest in finding out what Cicero's views and reasons would be. It also makes his oration seem easy to them to know what he was talking about, as his original hearers did.

In connection with the first oration, it is necessary to investigate the case of the Gracchi and try to see what their attempts meant. This helps the students to get more light on the crisis and see how long it had been developing. The pupils are also asked to study Cæsar in English by reading an article in an encyclopedia, and then Cæsar's life by Plutarch, and comparing it with Fowler's *Cæsar* and Mommsen's account of the same period. Besides this, each student is requested to be responsible for one other life by Plutarch, either that of Cato or of Cicero or of Pompey.

The geography thus far has been confined to the movements of Catiline in Italy and the significance of the Alps and Apennines as a double barrier for Roman civilization.

General Geology, Eleventh Grade: (Wallace W. Atwood.) The work of this course as outlined for December was not completed during that month, and the work this month will be a further consideration of the physiographic areas of the eastern portion of the United States, following the outline published in the December number.

Art Expression Work in General Geology: I. Water-colored paintings of landscapes chosen from the eastern portions of the United States.

1. Coast scenes in New Jersey and North Carolina.
2. Coast scenes in New England.
3. Inland on the coastal plain.
4. Inland in the New England region.

II. Chalk modeling of scenes similar to those chosen for painting.

Chemistry: (Alice Peloubet Norton.) The study of the leaves and their constituents has introduced the pupil to the elements oxygen, hydrogen, nitrogen, and carbon. The properties of air and water have been investigated, as well as the phenomena of combustion. The students have become somewhat familiar with chemical methods and the processes of analysis and synthesis, and have learned some chemical nomenclature, and become acquainted with certain classes of compounds, as the oxides and carbonates.

The next step is the investigation of the mineral matter of the leaves. The ash is mixed with distilled water, thoroughly stirred, and then filtered and washed, and the filtrate evaporated and weighed. The flame test is then applied to discover the presence or absence of potassium and sodium. Some of the residue is again dissolved, and a few drops of silver nitrate added to the test for chlorine. To further study chlorine, it is prepared for the students from manganese dioxide and hydrochloric acid in the usual way. A jet of hydrogen burned in the chlorine, with the consequent formation of hydrochloric acid, may lead to the discussion of the meaning of the term "acid." The best opportunity for introducing this, with the supplementary ideas of "base" and "salt," will be carefully sought.

The following quantitative experiment for the determination of the chlorine in common salt will be used:

Pulverize about 5 grams of table salt, and dry it thoroughly by heating it in an evaporator for five minutes over the Bunsen burner flame. When cool weigh out exactly 1 gram of the salt. Put this in a

beaker. Add about 30 c. c. of distilled water, and warm until the salt dissolves. Add 10 drops of nitric acid. Measure out 125 c. c. of silver nitrate solution, and, using a stirring rod to direct the stream, pour carefully, with constant stirring, the nitrate solution into the salt solution. Protect the contents of the beaker from the action of sunlight. Heat gently, with occasional stirring, until the precipitate has settled. Have ready in a funnel a well-dried and weighed filter paper. Decant the clear liquid down the rod into the filter. Transfer all the precipitate to the filter. In order to get out the last particle, use your rod and a stream of water from the wash bottle. Wash the precipitate well with distilled water until 3 c. c. of the filtrate gives no turpidity with one drop of hydrochloric acid. Dry the precipitate on the filter paper to constant weight, being careful not to burn the paper. Find the weight of the silver chloride formed. Calculate the percentage of chlorine in the sample of salt used.

This experiment will introduce the subject of the law of definite proportions. If the pupils are ready for it, the atomic theory in its simplest form will be taken up, with atomic and molecular weight.

The amount of chlorine as well as the proportion of chlorides in the ash will be calculated.

Mathematics: (GEORGE W. MYERS.) The work for this month will be the same for these grades, and it will include the study by trigonometric methods of the same subject-matter as is given under the heading Geometry for the Ninth Grade. In addition to this, some work will be begun with the compass, transit, and other civil engineering instruments, by way of preparation for the field-work, which will be again taken up as soon as the weather will permit. During this month plain trigonometry will be completed, and numerous exercises will be given in the design of parts of structures, in the composition and resolution of forces, and in the triangulation of distances.

High School and Ensemble Songs: *The Happy Farmer, Peaceful Slumbering, Thy Mercies, Lord,* (canon for two voices); *We Merry Minstrels* (round, three parts), Modern Music Series, Third Book; *The Fir Tree, All Ye Nations, On the Wild Rose Tree, Ring Out, Wild Bells,* Songs of Life and Nature.

Morning Exercises

"So may the New Year be a happy one to you, happy to many more whose happiness depends on you. So may each year be happier than the last, and not the meanest of our brethren or sisterhood debarred their rightful share in what our Great Creator formed them to enjoy."

CHARLES DICKENS.

JANUARY	SUBJECT.	LEADER.
1.	The New Year	Miss Stilwell.
2.	The Children's Christmas	Mrs. Atwood.
3.	Time	Mr. G. W. Myers.
4.	Recent Events in Science	Mr. Atwood.
8.	Games	Miss Allen.
9.	Fairies	Miss Champlin.
10.	Marco Polo	Mrs. Flint.
11.	The Talk of the Bookshelves	Miss Warren.
15.	Alfred Tennyson	Mr. Flint.
16.	Les Jardins de Paris	Miss Ashlémann.
17.	Benjamin Franklin	Mr. Carman.
18.	Nuremberg	Miss Payne.
22.	Stories	Miss Cooke.
23.	The Sand Dunes	Miss Baber.
24.	Egypt	Mrs. Thompson.
25.	Robert Burns	Mr. Duncan
29.	History and Poetry	Dr. Benignus.
30.	Winter Sports	Miss Crawford.
31.	Wood	Mr. Carley.

Historical Events and Birthdays

January	1	Emancipation Proclamation Issued	1863
"	1	First Printing Press in America	1639
"	3	Battle of Princeton	1777
"	6	Charles Sumner	1811
"	8	Battle of New Orleans	1815
"	11	Thomas J. Edison	1847
"	11	Bayard Taylor	1825
"	11	Alexander Hamilton	1757
"	12	Pestalozzi	1746
"	12	Alfred Tennyson	1810
"	17	Battle of Cowpens	1781
"	17	Benjamin Franklin	1706
"	18	Daniel Webster	1782
"	22	Lord Bacon	1561
"	25	Robert Burns	1759
"	27	Johann Mozart	1756

Gavotte

CARL REINECKE, Op. 173, No. 3.

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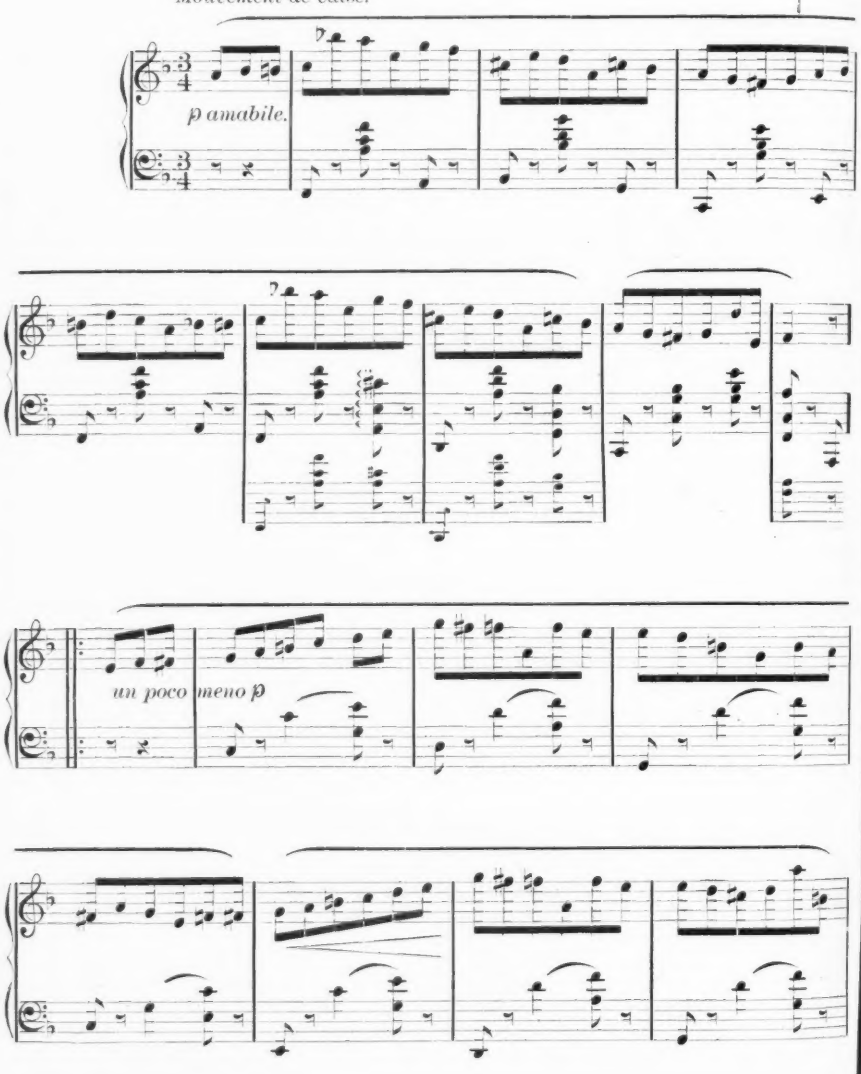
La Sylphide

From Bal Masque, Sept airs de Ballet. S. Jadassohn.

Mouvement de valse.



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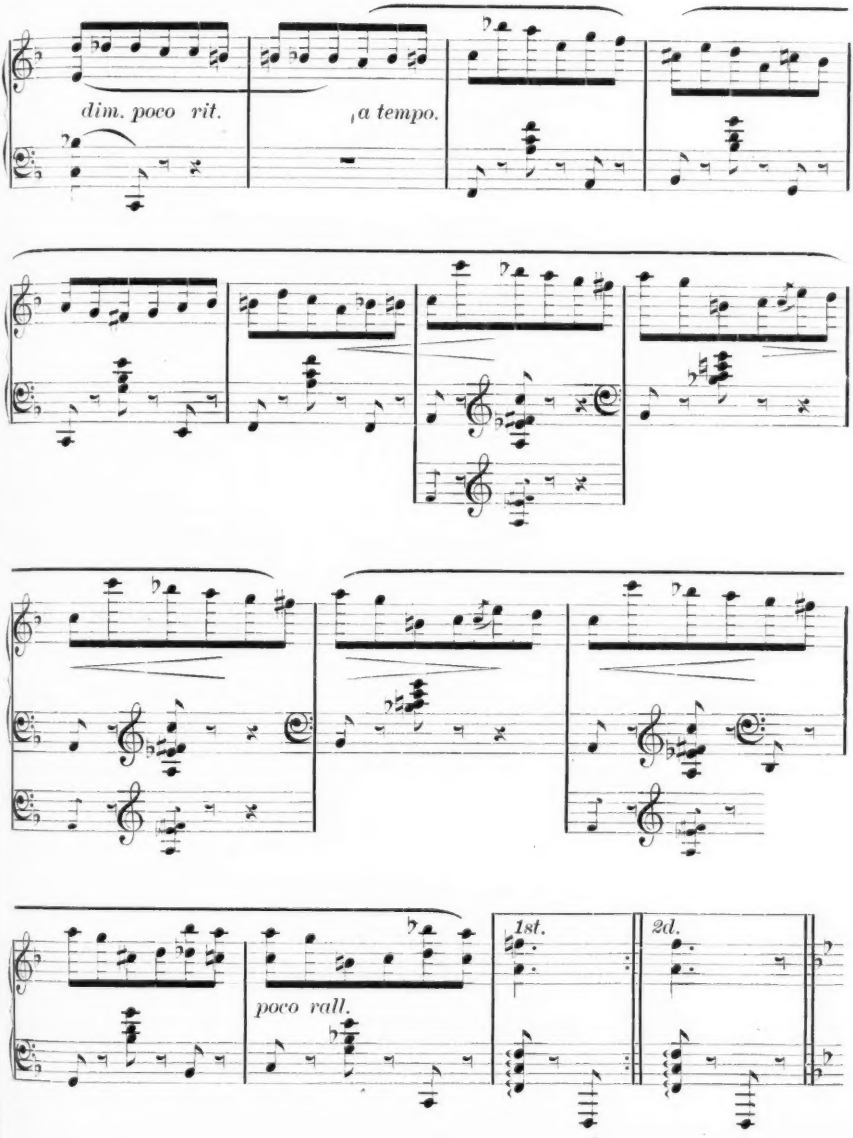

Reading List

Art and Industry

Binns.	*Story of the Potter.*	Mansfield.
Chase and Clow.	*Stories of Industry.*	Educ. Pub. Co.
Marsden.	*Cotton Spinning.*	Bell.
Marsden.	*Cotton Weaving.*	Bell.

Geography, Geology, and Travel

Ballou.	*Foot-Prints of Travel.*	Ginn.
Boner.	*Transylvania.*	Longmans.
Brown.	*Peoples of the World.*	Cassell.
Carpenter.	*North America.*	Am. Bk. Co.
Chisholm.	*Handbook of Commercial Geography.*	Longmans.
Davis.	*Elementary Meteorology.*	Ginn.
Davis.	*Physical Geography.*	Ginn.
Davis.	*Physical Geography of Southern New England.*	Am. Bk. Co.
Dawson.	*Compendium of Geography of North America.*	Stanford.
Dunlop and Dunlop.	*How We Spent the Autumn.*	Bentley.
Frye.	*Complete Geography.*	Ginn.
Gannett.	*Compendium of Geography of North America.*	Stanford.
Hayes.	*Southern Appalachians.*	Am. Bk. Co.
Holmes.	*Our Hundred Days in Europe.*	Houghton.
Mill.	*International Geography.*	Appleton.
	Grammar School Geography.	Rand-McNally.
Powell.	*National Geographic Monographs.*	Am. Bk. Co.
Reclus.	*Earth and Its Inhabitants.*	Appleton.
Russell.	*Glaciers of North America.*	Ginn.
Russell.	*Lakes of North America.*	Ginn.
Russell.	*Rivers of North America.*	Putnam.
Russell.	*Volcanoes of North America.*	Macmillan.
Shaler.	*Story of Our Continent.*	Ginn.
Shaler.	*United States of America.*	Appleton.
Shaler.	*Nature and Man in America.*	Scribner.
Tarr and McMurry.	*North America.*	Macmillan.
Tarr and McMurry.	*Home Geography.*	Macmillan.
Tarr.	*First Book of Physical Geography.*	Macmillan.
Tarbell.	*Werner Geography.*	Werner.
Waldo.	*Elementary Meteorology.*	Am. Bk. Co.
Willis.	*Northern Appalachians*	Am. Bk. Co.

History

Fiske.	*Critical Period of American History.*	Houghton.
Fiske.	*Discovery of America.*	Houghton.
Fiske.	*Dutch and Quaker Colonies in America.*	Houghton.
Frothingham.	*Rise of the Republic.*	Little.
Gay.	*Madison.* (American Statesmen).	Houghton.

Hart	*American History Told by Contemporaries*	Macmillan.
Hart	*Formation of the Union*	Longmans.
Hart and Channing	*American History Leaflets*	Lovell.
Lodge	*Washington.* (American Statesmen)	Houghton.
Lodge	*Hamilton.* (American Statesmen)	Houghton.
Lamartine	*History of Celebrated Characters*	Bentley.
McMaster	*History of the United States*	Appleton.
Mason	*Origins of Invention*	Scribner.
Morgan	*Ancient Society*	Holt.
Motley	*Rise of the Dutch Republic*	Bell.
Nadaillac	*Prehistoric America*	Putnam.
Nadaillac	*Prehistoric Peoples*	Putnam.
Payne	*History of America*	Macmillan.
Rice	*Outlines in History*	Flanagan.
Starr	*Some First Steps in Human Progress*	Winona Pub. Co.
Schouler	*History of the United States*	Dodd.
Winsor	*Narrative and Critical History of America*	Houghton.

Literature

Dodge	*Hans Brinker*	Scribner.
Irving	*Knickerbocker History of New York*	Putnam.
Irving	*Legend of Sleepy Hollow*	Putnam.
Irving	*Rip Van Winkle*	Putnam.
Lanier	*Science of English Verse*	Scribner.
Longfellow	*Hiawatha*	Houghton.
Longfellow	*Kéramos*	Houghton.
Sherman	*Little Folk Lyrics*	Houghton.
Stevenson	*Child's Garden of Verse*	Scribner.

Psychology and Pedagogy

Fiske	*Outlines of Cosmic Philosophy*	Houghton.
Froebel	*Education of Man*	Appleton.
Richter	*Levana*	Heath.
Scripture	*New Psychology*	Houghton.
Titchener	*Outline of Psychology*	Macmillan.
Wundt	*Human and Animal Psychology*	Sonnenschein.

Science

Cooke	*Nature Myths*	Flanagan.
Coulter	*Plant Relations*	Appleton.
Murché	*Science Readers*	Macmillan.
Rowley	*Art of Taxidermy*	Appleton.

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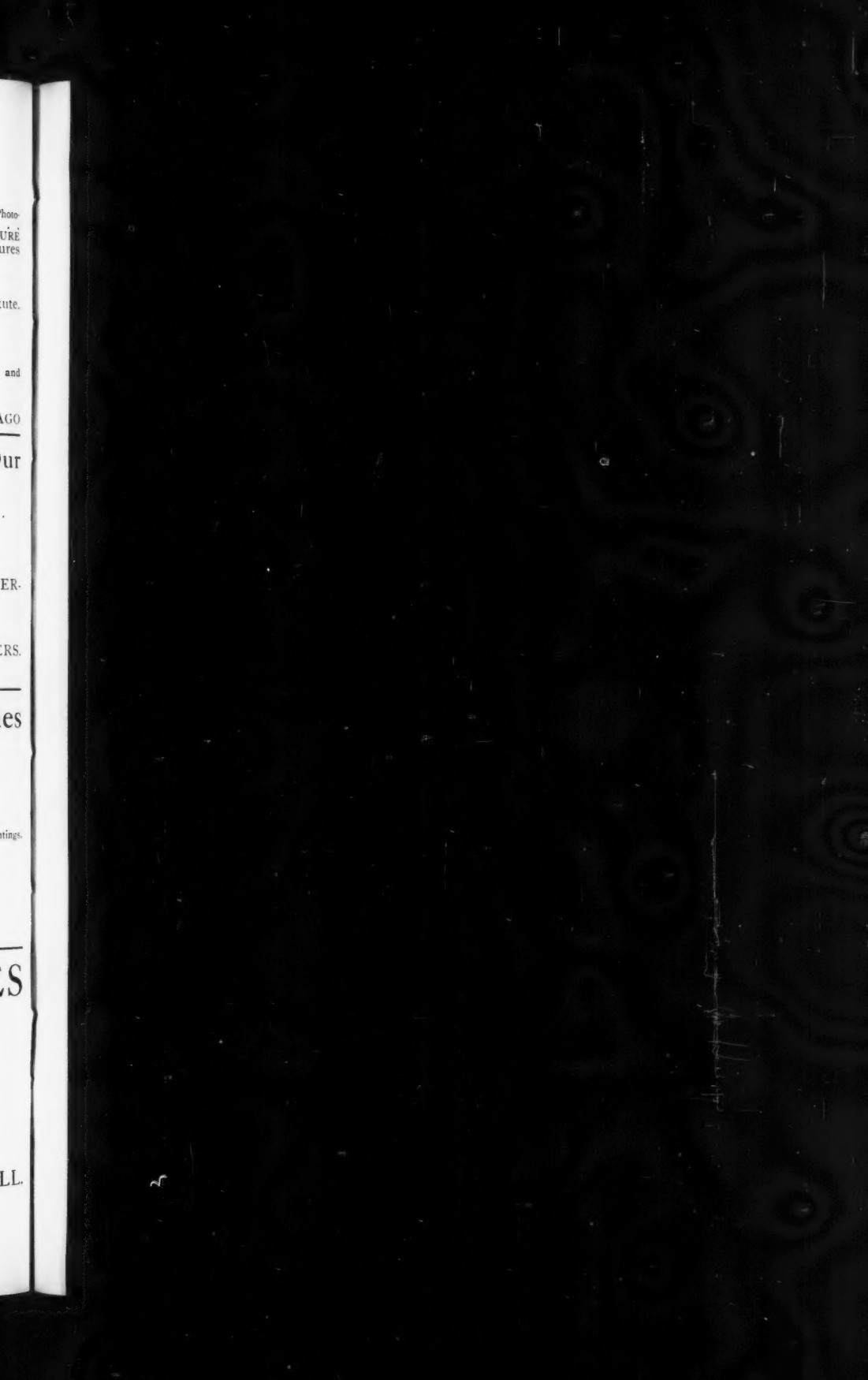
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